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### EDUCATION IN ONTARIO

Costs and Future Educational  
Requirements for the Labour Force

Economic Planning Branch  
Policy Planning Division  
Department of Treasury and Economics



V. Darcy McKeough  
Minister of Ontario  
of Economics

H. Ian Macdonald  
Deputy Minister

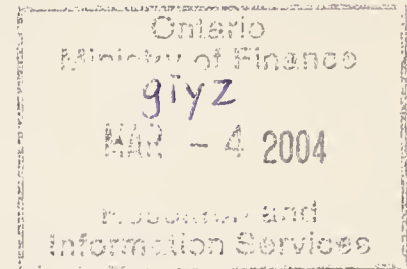
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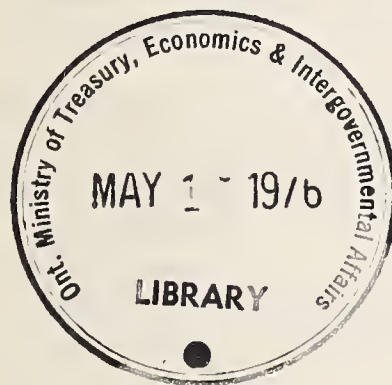


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Hon. W. Darcy McKeough  
Treasurer of Ontario  
and Minister of Economics

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September, 1971



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## CHAPTER I

### INTRODUCTION

The rapid growth in the educational sector in recent years has been the result of both demographic factors and social attitudes. There appears to be a coincidental stabilization of both of these forces of growth. Birth rates started to decline in the sixties with a resultant reduction in the rate of new entrants to the elementary schools. These will be affecting the secondary school enrolment in the late seventies.

The slowdown in the demand for teachers at the elementary level and the implications of this slowdown for future demand has given young people entering university pause for thought. The educational system has been absorbing a large proportion of its own product. The knowledge that this is not an insatiable market makes the acquisition of university education a more questionable goal. In the past few years, the increase in teachers at all levels from elementary to university has totalled about 6,500 per year. This amounts to about one-third the number receiving first degrees and, at the university level, has been absorbing virtually all the Ph.D's. If the retirements from the system are counted, the educational system has probably been taking up about two-thirds of its own output.

The number of graduates is rising sharply and the number of persons taking graduate work has risen phenomenally. The demand



for teachers is at the same time slowing down so that there is a surplus in some of the highly educated categories.

At the same time that these significant shifts are occurring in the educational system, our manpower requirements are becoming more pressing. In the past, we have filled whole segments of industrial demand for labour through immigration. As our own supply of new labour force entrants is sharply increasing,<sup>(1)</sup> we will have to ensure that a broader cross section of needs are supplied internally. Much greater concentration of education and training in the secondary commercial and scientific groups and in post-secondary training other than university is needed to meet the future demands of our growth industries.

This report provides a brief review of enrolment trends at all educational levels, unit cost trends for the main educational levels, teacher requirements, and manpower requirements for economic growth.

(1) See Table Page 3.



Ontario Labour Force

| <u>Year</u> | <u>Labour Force<br/>Increase</u><br>(000's) | <u>Annual Number of Immigrants<br/>Expected to go into the<br/>Labour Force<sup>(1)</sup></u><br>(000's) | <u>Annual Number of Immigrants<br/>as a Per Cent of<br/>Labour Force Increase</u> |
|-------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| 1951-56     | 277                                         | 256                                                                                                      | 92.4                                                                              |
| 1956-61     | 254                                         | 181                                                                                                      | 71.3                                                                              |
| 1961-62     | 21                                          | 18                                                                                                       | 85.7                                                                              |
| 1962-63     | 54                                          | 24                                                                                                       | 44.4                                                                              |
| 1963-64     | 80                                          | 30                                                                                                       | 37.5                                                                              |
| 1964-65     | 58                                          | 40                                                                                                       | 69.0                                                                              |
| 1965-66     | 105                                         | 53                                                                                                       | 50.7                                                                              |
| 1966-67     | 115                                         | 62                                                                                                       | 53.9                                                                              |
| 1967-68     | 100                                         | 50                                                                                                       | 50.0                                                                              |
| 1968-69     | 98                                          | 46                                                                                                       | 46.9                                                                              |
| 1969-70     | 98                                          | 43                                                                                                       | 43.9                                                                              |

(1) All figures are for calendar years 1951-1970.

Source: DBS Census of Canada  
Labour Force Survey (1965 Revision)







## CHAPTER II

### ENROLMENT

#### Elementary School

School enrolment, at the elementary level, is almost entirely dependent on population numbers in the relevant age group. For some years, elementary school enrolment has averaged about 93 per cent of the 5-14 year olds and we expect that this enrolment ratio will continue over the forecast period.

The numbers of elementary school students in the Province rose rapidly during the fifties and sixties with average increases of 50,000 and 35,000 respectively over the two decades. The rate of increase slowed down in the late sixties as birth rates began to decline in 1960. The numbers leaving the system to move into secondary school are still somewhat fewer than the new entrants, but we expect that the peak in elementary school enrolment will be reached in 1971-72 with a total of 1,472,000 or an increase of only 8,000 from last year's total. Because of the age distribution of the population, we expect a gradual decline in numbers of elementary school students of about 20,000 per year to a total of 1,391,000 in 1975-76.

#### Secondary School

The large outflow from the elementary school system is now moving into the secondary school system. Because we expect the population in this age category (15-19 years) to



continue increasing through 1975-76, we expect secondary student enrolment to increase by about 25,000 per year to 1975-76. By 1976, the effects of the present declining birth rate should begin to be reflected in the size of secondary school enrolment.

The increasing numbers of secondary school students is the result of both increased population in the relevant age group and the increasing proportion of young people completing secondary school. In the early fifties, just over 40 per cent of the fifteen to nineteen year age group were in secondary school, while now 80 per cent are at school. We expect this proportion to continue to rise to 85 per cent by 1975-76. Thus by 1975-76, we will probably have an additional 126,000 pupils in Ontario secondary schools or a total of 683,300.



Enrolment in Ontario Elementary Schools with Projections for 1971-75

| <u>Year</u> | <u>Population<br/>5-14 Years</u> | <u>Elementary School<br/>Enrolment</u> | <u>Proportion Enrolled<br/>in Elementary School</u> |
|-------------|----------------------------------|----------------------------------------|-----------------------------------------------------|
| 1967-68     | 1,498,100                        | 1,405,052                              | 93.8                                                |
| 1968-69     | 1,532,000                        | 1,430,590                              | 93.4                                                |
| 1969-70     | 1,557,200                        | 1,456,117                              | 93.5                                                |
| 1970-71     | 1,582,200                        | 1,464,996                              | 92.6                                                |

Projections

|         |           |           |      |
|---------|-----------|-----------|------|
| 1971-72 | 1,583,600 | 1,472,800 | 93.0 |
| 1972-73 | 1,570,000 | 1,460,100 | 93.0 |
| 1973-74 | 1,547,700 | 1,439,400 | 93.0 |
| 1974-75 | 1,521,900 | 1,415,400 | 93.0 |
| 1975-76 | 1,495,700 | 1,391,000 | 93.0 |

Source: Annual Reports of the Minister of Education  
DBS Intercensal Population Estimated by 5-year Age Groups  
Population and Enrolment Projections - Department of Treasury & Economics.

Enrolment in Ontario Secondary Schools with Projections for 1971-75

| <u>Year</u> | <u>Population<br/>15-19 Years</u> | <u>Secondary School<br/>Enrolment</u> | <u>Proportion Enrolled<br/>in Secondary School</u> |
|-------------|-----------------------------------|---------------------------------------|----------------------------------------------------|
| 1967-68     | 626,300                           | 463,736                               | 74.0                                               |
| 1968-69     | 649,800                           | 500,807                               | 77.1                                               |
| 1969-70     | 667,600                           | 530,679                               | 79.5                                               |
| 1970-71     | 693,600                           | 556,913                               | 80.3                                               |

Projections

|         |         |         |      |
|---------|---------|---------|------|
| 1971-72 | 716,800 | 582,800 | 81.3 |
| 1972-73 | 740,300 | 608,500 | 82.2 |
| 1973-74 | 763,100 | 634,100 | 83.1 |
| 1974-75 | 784,700 | 659,900 | 84.1 |
| 1975-76 | 803,900 | 683,300 | 85.0 |

Source: Annual Reports of the Minister of Education  
DBS Population Estimates by 5-year Age Groups  
Population and Enrolment Projections - Department of Treasury & Economics.



### Post-Secondary Enrolments

The increased emphasis on post-secondary education has brought a phenomenal rise in the number of students. Population growth alone would have meant a fairly rapid rise, but there was also an increase in the percentage of the appropriate age groups that continued their education. The numbers of young people of post-secondary age will continue to grow for some years.

In the past, the university was responsible for most of the post-secondary education but the Colleges of Applied Arts and Technology, which have been moving into operation very rapidly, will account for an ever-increasing proportion of post-secondary students in the future. Students in the Community Colleges are mostly between the ages of 18 and 20. This group is expected to increase from about 400,000 in 1970-71 to about 465,000 by 1975-76. We are projecting steady growth in full-time enrolment at the Colleges from 53,372 in 1970-71 to a total of 92,900 in 1975-76. We have assumed that the proportion enrolled in 1975-76 will gradually increase to 20 per cent of the 18-20 year olds as compared with 13.3 per cent in 1970-71.



Full-Time September Enrolment in Ontario Colleges of  
Applied Arts and Technology, 1963-70 with Projections for 1971-75

| <u>Year</u>        | <u>Estimated Population<br/>18-20 Years</u> | <u>CAAT<br/>Enrolment</u> | <u>Proportion of Persons<br/>18-20 Years Enrolled</u> |
|--------------------|---------------------------------------------|---------------------------|-------------------------------------------------------|
| 1963-64            | 277,500                                     | 6,147                     | 2.2                                                   |
| 1964-65            | 300,800                                     | 7,977                     | 2.7                                                   |
| 1965-66            | 324,100                                     | 9,218                     | 2.8                                                   |
| 1966-67            | 348,347 <sup>(1)</sup>                      | 11,655                    | 3.3                                                   |
| 1967-68            | 352,700                                     | 19,252                    | 5.5                                                   |
| 1968-69            | 371,500                                     | 28,052                    | 7.6                                                   |
| 1969-70            | 385,000                                     | 43,542 <sup>(2)</sup>     | 11.3                                                  |
| 1970-71            | 400,200                                     | 53,372                    | 13.3                                                  |
| <u>Projections</u> |                                             |                           |                                                       |
| 1971-72            | 411,400                                     | 60,900                    | 14.8                                                  |
| 1972-73            | 422,900                                     | 68,100                    | 16.1                                                  |
| 1973-74            | 435,500                                     | 75,800                    | 17.4                                                  |
| 1974-75            | 449,900                                     | 84,100                    | 18.7                                                  |
| 1975-76            | 464,600                                     | 92,900                    | 20.0                                                  |

---

(1) Census data.

(2) Beginning in 1969-70 enrolment includes apprentices and manpower trainees. (This group accounted for 13,071 students in 1969-70.)

Source: Annual Reports of the Minister of Education and Education Data Centre  
DBS Population Estimates by 5-Year Age Groups and Single Years of Age  
Population and Enrolment Projections - Department of Treasury and Economics



### University

University enrolment showed a fantastic increase in the sixties. In 1970-71 there were more than  $3\frac{1}{2}$  times as many full-time students as there were in 1960-61. The university age category, 18 to 21 years, will continue to increase from 530,400 in 1970-71 to 612,600 in 1975-76. However, with the Community Colleges absorbing an increasing number of post-secondary students, university enrolment will advance at a slow rate from 118,077 in 1970-71 to 140,800 in 1975-76 - an average annual increase of about 4 per cent. This compares with an average annual increase of approximately 20 per cent over the preceding 5-year period. We have assumed that the proportion of undergraduates enrolled stays constant at 20 per cent of the age bracket 18-21 years (19.5 per cent in 1970-71) and the proportion of graduates enrolled in 1975-76 will constitute 2.5 per cent of the 20-24 age bracket (2.3 per cent in 1970-71).



Full-Time Enrolment in Ontario Universities, 1963-70 with Projections for 1971-75

| <u>Year</u> | <u>Est. Pop.<br/>18-21</u> | <u>Undergrad.<br/>Enrol.</u> | <u>Undergrad. Enrol.<br/>as % of Pop. 18-21</u> | <u>Est. Pop.<br/>20-24</u> | <u>Grad.<br/>Enrol.</u> | <u>Grad. Enrol.<br/>as % of Pop. 20-24</u> | <u>Ttl. Univ.<br/>Enrolment</u> |
|-------------|----------------------------|------------------------------|-------------------------------------------------|----------------------------|-------------------------|--------------------------------------------|---------------------------------|
| 1963-64     | 358,500                    | 39,990                       | 11.2                                            | 407,000                    | 4,201                   | 1.0                                        | 44,191                          |
| 1964-65     | 386,000                    | 45,369                       | 11.8                                            | 427,900                    | 5,424                   | 1.3                                        | 50,793                          |
| 1965-66     | 414,100                    | 52,124                       | 12.6                                            | 452,300                    | 6,859                   | 1.5                                        | 58,983                          |
| 1966-67     | 444,919(1)                 | 60,862                       | 13.7                                            | 485,100                    | 7,727                   | 1.6                                        | 68,589                          |
| 1967-68     | 461,500                    | 69,307                       | 15.0                                            | 524,400                    | 9,782                   | 1.9                                        | 79,098                          |
| 1968-69     | 487,200                    | 81,091                       | 16.6                                            | 561,200                    | 11,498                  | 2.0                                        | 92,589                          |
| 1969-70(2)  | 508,400                    | 91,484                       | 18.0                                            | 599,200                    | 13,458                  | 2.2                                        | 104,942                         |
| 1970-71(3)  | 530,400                    | 103,518                      | 19.5                                            | 634,200                    | 14,559                  | 2.3                                        | 118,077                         |

Projections

|         |         |         |      |         |        |     |         |
|---------|---------|---------|------|---------|--------|-----|---------|
| 1971-72 | 545,600 | 109,120 | 20.0 | 658,800 | 15,800 | 2.4 | 124,900 |
| 1972-73 | 560,400 | 112,080 | 20.0 | 679,200 | 17,000 | 2.5 | 129,100 |
| 1973-74 | 575,900 | 115,180 | 20.0 | 696,100 | 17,400 | 2.5 | 132,600 |
| 1974-75 | 593,700 | 118,740 | 20.0 | 712,900 | 17,800 | 2.5 | 136,500 |
| 1975-76 | 612,600 | 122,520 | 20.0 | 731,200 | 18,300 | 2.5 | 140,800 |

(1) Census data.

(2) It should be noted that beginning in 1969-70 enrolment figures include only those students preparing for degrees and university level diplomas. In the past, other groups of non-degree and non-diploma students were included as undergraduate students.

(3) Enrolment figures are preliminary.

Source: DBS - Survey of Higher Education, Parts 1 and 2.

DBS - Daily of May 19, 1970

DBS - Census Population

DBS - Population Estimates by 5-year age groups

DBS - Population Estimates by single years of age

Population and Enrolment Projections - Department of Treasury and Economics.



Degrees Awarded in 1969-70 and 1970-71  
by Ontario Government Supported Universities

|            | <u>1969-70</u> | <u>1970-71</u> <sup>(1)</sup> |
|------------|----------------|-------------------------------|
| Bachelor's | 20,523         | 24,022                        |
| Master's   | 4,157          | 4,800                         |
| Doctoral   | 658            | 915                           |

Full-Time Graduate Enrolment in all Ontario Universities

| <u>1969-70</u> | <u>1970-71</u> <sup>(2)</sup> |
|----------------|-------------------------------|
| 13,458         | 14,559                        |

Full-Time Undergraduate Enrolment in all Ontario Universities

| <u>1969-70</u> | <u>1970-71</u> <sup>(2)</sup> |
|----------------|-------------------------------|
| 91,484         | 103,518                       |

(1) Estimated by universities.

(2) Preliminary.







### CHAPTER III

#### Operating Costs per Student

Costs of education have risen very rapidly, both because of increased enrolment and higher unit costs. At the elementary and secondary level, operating costs per student are expected to continue increasing, but at a reduced rate. Under regulations established by the Department of Education, elementary and secondary school boards will have to hold their expenditures within prescribed ceilings by 1972. Teacher-pupil ratios at both elementary and secondary levels will probably be held at 1971-72 levels. Since only a minimal increase in the proportion enrolled is expected at the elementary level (92.6 per cent of eligible population now enrolled) and only slight increases at the secondary level (80.3 per cent to 85.0 per cent in 1975-76), few new teachers will be entering the system.

Teachers' salaries are the major factor in costs, accounting for approximately 70 per cent of operating expenditures. Recent salary increases have been in the order of 8.5 per cent and salaries will continue to rise. The total salary bill will be forced upward by the incumbent teachers who will continue to move further up the salary scale. Hence we are projecting slightly higher increases in operating costs at the elementary level where the teaching force is likely to be fairly stable than at the higher educational levels where expansion will continue.



The pupil-teacher ratio at the Colleges of Applied Arts and Technology is expected to remain at the ratio of 15.0:1. Unlike last year when the colleges sought grants on the basis of expected enrolment, the new provincial grant system restricts money to full-time, post-secondary students actually enrolled. A 15 per cent reduction in federal grants for adult retraining courses has resulted in staff cutbacks. We anticipate that the CAATs will eventually train about one-fifth (13.3 per cent in 1970-71) of the eligible population and have based our likely projections on reaching that proportion of the 18-20 year olds by 1975-76. The resultant expansion of the community college teaching force will push the total instructional salary bill downward - these salaries account for more than 60 per cent of operating costs - as new, inexperienced teachers enter the system at the lower end of the salary scale.

Because of the restraints on government expenditures, universities will be forced to undertake cutbacks in fringe areas such as research activity. Pay rates for teaching - constituting over 60 per cent of operating costs - have been increasing at about 8 per cent and will continue to increase. However, the pupil-teacher ratio will be held at the ratio of 12.5:1. Since 80-90 per cent of all teachers hired by universities today possess a Doctorate degree, no significant increase in



costs is anticipated with respect to raising the qualifications of the university teaching force.

Operating costs per elementary student were about \$640 in 1970-71 - an increase of 12.1 per cent from the previous year. Based on recent cost trends, we expect a gradual decline in cost increases to 6 per cent per annum by 1974-75. The projected operating costs for 1975-76 is \$914 per student.

Student costs in secondary school, at about \$1,156 in 1970-71, are nearly double those in elementary schools but they have been increasing much less rapidly than have those in elementary schools. Our projections indicate per student cost at the secondary level will increase by 6 per cent annually to a total of \$1,548 by 1975-76.

Operating costs per full-time equivalent post-secondary student at the Colleges of Applied Arts and Technology in 1970-71 were \$1,850. Whereas this represents an increase of 6.8 per cent from the previous year, operating costs declined by almost 11 per cent per student between 1968-69 and 1969-70 as the original opening costs were levelled out. Costs are likely to increase at the rate of 5 per cent per year over each of the next five years, resulting in an operating cost per student of \$2,361 in 1975-76.

With respect to apprenticeship training at the CAATs, operating cost per full-time equivalent was \$2,479 in 1970-71 or



\$12.40 per student day. While this represents an increase of 3.2 per cent from the previous year, operating costs to 1975-76 are expected to grow at an annual rate of 4.5 per cent which would mean that the operating cost per apprentice place would be \$3,090 or \$15.46 per student day in 1975-76.

Operating costs per full-time equivalent trainee at the Colleges in 1970-71 were \$1,922, a decrease of 2.3 per cent from the previous year. The 1969-70 costs were particularly high because of introductory costs in the early years of the program. We expect cost increases to average about 6.5 per cent per annum to 1975-76. The projected operating cost for 1975-76 is \$2,645 per student.

Operating costs at Ryerson are running at \$1,454 per full-time equivalent student per year. If the unit costs of this program increase by 9 per cent per year to 1975-76, the operating costs would be about \$2,239 per student in that year.

At the university level, full-time operating costs were estimated at \$3,677 in 1970-71 - an increase of 3.5 per cent from the previous year. These operating costs can be expected to increase at about 3 per cent per year over the next five years, reaching \$4,277 in 1975-76.



Elementary - Operating Costs per Student

| <u>Year</u>        | <u>Net Day School Expenditures Minus<br/>Pupil Welfare Services Minus Capital<br/>Expenditure (1) (non-alloable)</u> | <u>Full-Time<br/>Sept. Enrolment</u> | <u>Operating Costs<br/>Per Student</u> | <u>% Increase</u> | <u>Total Operating<br/>Costs</u> |
|--------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------|-------------------|----------------------------------|
| 1967-68            | \$575,928,000                                                                                                        | 1,405,052                            | \$410                                  | 20.5              | \$576,071,320                    |
| 1968-69            | 706,584,000                                                                                                          | 1,430,590                            | 494                                    | 15.6              | 706,711,460                      |
| 1969-70            | 831,499,000                                                                                                          | 1,456,117                            | 571                                    | 12.1              | 831,442,807                      |
| 1970-71            | 937,890,517                                                                                                          | 1,464,996                            | 640                                    |                   | 937,597,440                      |
| <u>Projections</u> |                                                                                                                      |                                      |                                        | 10.0              | 16                               |
| 1971-72            |                                                                                                                      | 1,472,800                            | 704                                    | 8.0               | 1,036,851,200                    |
| 1972-73            |                                                                                                                      | 1,460,100                            | 760                                    | 7.0               | 1,109,676,000                    |
| 1973-74            |                                                                                                                      | 1,439,400                            | 813                                    | 6.0               | 1,170,232,200                    |
| 1974-75            |                                                                                                                      | 1,415,400                            | 862                                    | 6.0               | 1,220,074,800                    |
| 1975-76            |                                                                                                                      | 1,391,000                            | 914                                    | 6.0               | 1,271,374,000                    |

(1) Based on calendar year.

Source: Department of Education - Grants Section  
Enrolment and Cost Projections - Department of Treasury & Economics



Secondary - Operating Costs per Student

| <u>Year</u>        | <u>Net Day School Expenditures Minus<br/>Pupil Welfare Services Minus Capital<br/>Expenditure (1) (Non-allocable)</u> | <u>Full-Time<br/>Sept. Enrolment</u> | <u>Operating Costs<br/>Per Student</u> | <u>% Increase</u> | <u>Total Operating<br/>Costs</u> |
|--------------------|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------|-------------------|----------------------------------|
| 1967-68            | \$395,183,000                                                                                                         | 463,736                              | 852                                    | 11.4              | \$395,103,072                    |
| 1968-69            | 475,476,000                                                                                                           | 500,807                              | 949                                    | 13.9              | 475,265,843                      |
| 1969-70            | 573,843,000                                                                                                           | 530,679                              | 1,081                                  | 6.9               | 573,663,999                      |
| 1970-71            | 655,169,287                                                                                                           | 556,913                              | 1,156                                  |                   | 643,791,428                      |
| <u>Projections</u> |                                                                                                                       |                                      |                                        | 6.0               | - 17                             |
| 1971-72            |                                                                                                                       | 582,800                              | 1,225                                  |                   | 713,930,000                      |
| 1972-73            |                                                                                                                       | 608,500                              | 1,299                                  | 6.0               | 790,441,500                      |
| 1973-74            |                                                                                                                       | 634,100                              | 1,377                                  | 6.0               | 873,155,700                      |
| 1974-75            |                                                                                                                       | 659,900                              | 1,460                                  | 6.0               | 963,454,000                      |
| 1975-76            |                                                                                                                       | 683,300                              | 1,548                                  | 6.0               | 1,057,748,400                    |

(1) Based on calendar year.

Source: Department of Education - Grants Section.  
Enrolment and Cost Projections - Department of Treasury & Economics.



Colleges of Applied Arts and Technology - Operating Costs per Full-Time  
Equivalent Post-Secondary Student

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| <u>Year</u>            | <u>Full-Time<br/>Equivalent Enrolment</u> | <u>Operating Costs<br/>per Student</u> | <u>Percent<br/>Change</u> | <u>Total Operating<br/>Costs</u> |
|------------------------|-------------------------------------------|----------------------------------------|---------------------------|----------------------------------|
| 1968-69                | 24,328                                    | \$1,942                                |                           | \$47,255,455                     |
| 1969-70                | 31,548                                    | 1,732                                  | -10.8                     | 54,636,422                       |
| 1970-71                | 38,006                                    | 1,850                                  | +6.8                      | 70,325,904                       |
| <br><u>Projections</u> |                                           |                                        |                           |                                  |
| 1971-72                | 46,400                                    | 1,943                                  | +5.0                      | 90,155,200                       |
| 1972-73                | 54,300                                    | 2,040                                  | +5.0                      | 110,772,000                      |
| 1973-74                | 63,500                                    | 2,142                                  | +5.0                      | 136,017,000                      |
| 1974-75                | 74,300                                    | 2,249                                  | +5.0                      | 167,100,700                      |
| 1975-76                | 86,900                                    | 2,361                                  | +5.0                      | 205,170,900                      |

Source: Department of Education - CAATs Division  
- Business Administration Branch

Operating Cost and Enrolment Projections - Department of Treasury & Economics



Colleges of Applied Arts and Technology - Operating  
Costs per Full-Time Equivalent Apprentices

| <u>Year</u>        | <u>Full-Time<br/>Equiv. Enrol.</u> | <u>Student<br/>Days</u> | <u>Operating Costs<br/>per Student</u>  | <u>Percentage<br/>Change</u> | <u>Total Operating<br/>Costs</u> |
|--------------------|------------------------------------|-------------------------|-----------------------------------------|------------------------------|----------------------------------|
| 1968-69            |                                    |                         |                                         |                              |                                  |
| 1969-70            | 2,172                              | 434,380                 | \$2,402<br>(\$12.01 per student<br>day) | 3.2                          | \$5,217,002                      |
| 1970-71            | 2,271                              | 454,122                 | \$2,479<br>(\$12.40 per student<br>day) |                              | \$5,630,822                      |
| <u>Projections</u> |                                    |                         |                                         | 4.5                          |                                  |
| 1971-72            | 2,370                              | 474,560                 | \$2,591<br>(\$12.96 per student<br>day) |                              | \$6,140,670                      |
| 1972-73            | 2,480                              | 495,910                 | \$2,708<br>(\$13.54 per student<br>day) | 4.5                          | \$6,715,840                      |
| 1973-74            | 2,590                              | 518,230                 | \$2,830<br>(\$14.15 per student<br>day) | 4.5                          | \$7,329,700                      |
| 1974-75            | 2,710                              | 541,550                 | \$2,957<br>(\$14.79 per student<br>day) | 4.5                          | \$8,013,470                      |
| 1975-76            | 2,830                              | 565,920                 | \$3,090<br>(\$15.46 per student<br>day) | 4.5                          | \$8,744,700                      |

Source: Department of Labour

Operating Costs and Enrolment Projections - Department of Treasury & Economics



Colleges of Applied Arts and Technology - Operating Costs  
per Full-Time Equivalent Trainee

| <u>Year</u>        | <u>Full-Time<br/>Equiv. Enrol.</u> | <u>Trainee<br/>Days</u> | <u>Operating Cost<br/>per Trainee</u> | <u>% Change</u> | <u>Total Operating<br/>Costs</u> |
|--------------------|------------------------------------|-------------------------|---------------------------------------|-----------------|----------------------------------|
| 1968-69            | 16,088                             | 3,861,217               | \$1,517                               |                 | \$24,400,000                     |
| 1969-70            | 16,030                             | 3,847,000               | 1,967                                 | +29.7           | 31,537,986                       |
| 1970-71            | 18,333                             | 4,400,015               | 1,922                                 | -2.3            | 35,235,500                       |
| <u>Projections</u> |                                    |                         |                                       |                 |                                  |
| 1971-72            | 21,100                             | 5,060,017               | 2,076                                 | +8.0            | 43,803,600                       |
| 1972-73            | 24,300                             | 5,819,020               | 2,221                                 | +7.0            | 53,970,300                       |
| 1973-74            | 27,900                             | 6,691,873               | 2,354                                 | +6.0            | 65,676,600                       |
| 1974-75            | 32,100                             | 7,695,654               | 2,495                                 | +6.0            | 80,089,500                       |
| 1975-76            | 36,900                             | 8,850,002               | 2,645                                 | +6.0            | 97,600,500                       |

Source: Department of Education - Business Administration Branch

Operating Costs and Enrolment Projections, Department of Treasury & Economics.



Ryerson Polytechnical Institute - Operating Costs  
per Full-Time Equivalent Student

| <u>Year</u>        | <u>Full-Time<br/>Equivalent<br/>Enrolment</u> | <u>Operating<br/>Costs per<br/>Student</u><br>\$ | <u>% Change</u> | <u>Total<br/>Operating<br/>Costs</u> |
|--------------------|-----------------------------------------------|--------------------------------------------------|-----------------|--------------------------------------|
| 1968-69            | 8,451                                         | 1,146                                            | 14.7            | 9,688,000                            |
| 1969-70            | 8,647                                         | 1,315                                            | 10.6            | 11,370,000                           |
| 1970-71            | 9,000                                         | 1,454                                            |                 | 13,082,000                           |
| <u>Projections</u> |                                               |                                                  |                 |                                      |
| 1971-72            | 9,500                                         | 1,585                                            | 9.0             | 15,057,500                           |
| 1972-73            | 9,900                                         | 1,728                                            | 9.0             | 17,107,200                           |
| 1973-74            | 10,400                                        | 1,884                                            | 9.0             | 19,593,600                           |
| 1974-75            | 10,900                                        | 2,054                                            | 9.0             | 22,388,600                           |
| 1975-76            | 11,400                                        | 2,239                                            | 9.0             | 25,524,600                           |

Source: Ryerson Polytechnical Institute

Operating Costs and Enrolment Projections - Department of Treasury & Economics



Provincially-Supported Ontario Universities - Operating Costs per Student

| <u>Year</u>        | <u>Full-Time<br/>Enrolment</u> | <u>Operating Costs<br/>Per Student(1)</u> | <u>% Increase</u> | <u>Total Operating<br/>Costs</u> |
|--------------------|--------------------------------|-------------------------------------------|-------------------|----------------------------------|
| 1967-68            | 79,098                         | \$2,989                                   | 24.3              | \$236,423,922                    |
| 1968-69            | 92,589                         | 3,383                                     | 13.2              | 313,228,587                      |
| 1969-70            | 104,942                        | 3,551                                     | 5.0               | 372,649,042                      |
| 1970-71            | 118,077(2)                     | 3,677(est.)                               | 3.5               | 434,169,129                      |
| <u>Projections</u> |                                |                                           |                   |                                  |
| 1971-72            | 124,900                        | 3,800(3)                                  | 3.3               | 474,620,000                      |
| 1972-73            | 129,100                        | 3,914                                     | 3.0               | 505,297,400                      |
| 1973-74            | 132,600                        | 4,031                                     | 3.0               | 534,510,600                      |
| 1974-75            | 136,500                        | 4,152                                     | 3.0               | 566,748,000                      |
| 1975-76            | 140,800                        | 4,277                                     | 3.0               | 602,201,600                      |

(1) Figures exclude items not contributing to education of students.

(2) Enrolment figure is preliminary.

(3) Extrapolated by Department of University Affairs.

Source: Department of University Affairs.  
Projections - Department of Treasury & Economics.







## CHAPTER IV

### Ontario Teacher Requirements to 1975-76

#### I. Elementary

New employment prospects, based on enrolment projections for full-time elementary school teachers, will be significantly reduced in the next few years. Student enrolment in 1970-71 was 1,464,996; projected enrolment shows a gradual decline to 1,391,000 by 1975-76. Based on this information, the projected number of elementary school teachers required in 1975-76 will be 56,800, a reduction of 2,500 teaching positions over the five-year period. These figures have been compiled on the basis of a student-teacher ratio of 24.5:1.

The projected elementary teacher requirements, coupled with an estimate of future teacher withdrawals from the elementary school system (based on recent withdrawals), indicate that approximately 8,800 teaching opportunities will be available in 1971-72 as compared with only 7,000 in 1975-76 (refer to table). This means that there will be a sharp drop in demand for elementary teachers from the 9,900 hired in 1969-70. The Ontario Teachers' Colleges have turned out about 5,400 of those so that demand is still within the limits of our own training programs. However, any severe cut-backs in opportunities may tend to reduce the number of withdrawals each year as it becomes more difficult to re-enter the profession.



## II. Secondary

Based on enrolment projections, new employment prospects for full-time secondary school teachers show steady but slight growth to 1975-76. The student enrolment increase has been projected at the rate of approximately 25,000 per year. School enrolment in 1970-71 totalled 556,913 (this figure represents 80.3 per cent of the estimated population 15-19 years of age). Projected enrolment for 1975-76 is 683,300. It is significant to note that the proportion enrolled in secondary schools has been estimated at 85 per cent of the 15-19 age bracket. The current secondary teaching staff is 33,693. The projected figure for 1975-76 is 41,400, an increase of approximately 1,500 new secondary teachers per year at a student-teacher ratio of 16.5:1.

In view of the projected secondary teacher requirements, together with an estimate of future teacher withdrawals from the secondary school system (based on recent withdrawals), 5,100 teaching positions will be available in 1971-72 and 4,900 in 1975-76 (refer to table). These projections indicate that the number of additional teachers required will be nearly constant each year, but there will be a very slight reduction in demand from 1973 onwards. About 1,800 of the 5,100 acquisitions in 1969-70 were from the Ontario Colleges of Education.



Number of Elementary and Secondary School Teachers  
in Ontario with Projections for 1971-1975

| <u>Year</u>        | <u>Elementary</u> |                                  | <u>Secondary</u> |                                  | <u>Total<br/>Teachers</u> |
|--------------------|-------------------|----------------------------------|------------------|----------------------------------|---------------------------|
|                    | <u>Teachers</u>   | <u>Ratio<br/>Enrol./Teachers</u> | <u>Teachers</u>  | <u>Ratio<br/>Enrol./Teachers</u> |                           |
| 1963-64            | 40,875            | 30.2                             | 17,170           | 21.2                             | 58,045                    |
| 1964-65            | 42,750            | 29.9                             | 19,205           | 20.6                             | 61,955                    |
| 1965-66            | 44,967            | 29.4                             | 21,659           | 19.3                             | 66,626                    |
| 1966-67            | 47,647            | 28.6                             | 24,242           | 18.0                             | 71,889                    |
| 1967-68            | 51,018            | 27.5                             | 27,164           | 17.1                             | 78,182                    |
| 1968-69            | 54,587            | 26.2                             | 30,203           | 16.6                             | 84,790                    |
| 1969-70            | 57,587            | 25.3                             | 32,342           | 16.4                             | 89,929                    |
| 1970-71            | 59,307            | 24.7                             | 33,693           | 16.5                             | 93,000                    |
| <u>Projections</u> |                   |                                  |                  |                                  |                           |
| 1971-72            | 60,100            | 24.5                             | 35,300           | 16.5                             | 95,400                    |
| 1972-73            | 59,600            | 24.5                             | 36,900           | 16.5                             | 96,500                    |
| 1973-74            | 58,800            | 24.5                             | 38,400           | 16.5                             | 97,200                    |
| 1974-75            | 57,800            | 24.5                             | 40,000           | 16.5                             | 97,800                    |
| 1975-76            | 56,800            | 24.5                             | 41,400           | 16.5                             | 98,200                    |

Source: Annual Reports of the Minister of Education. Projections - Department of Treasury and Economics.

Projected Number of Teachers and of Teacher Acquisitions 1970-1975

| <u>Year</u> | <u>Elementary</u> |                              |                                  | <u>Secondary</u> |                              |                                  |
|-------------|-------------------|------------------------------|----------------------------------|------------------|------------------------------|----------------------------------|
|             | <u>Teachers</u>   | <u>Annual<br/>Withdrawal</u> | <u>Required<br/>Acquisitions</u> | <u>Teachers</u>  | <u>Annual<br/>Withdrawal</u> | <u>Required<br/>Acquisitions</u> |
| 1970-71     | 59,307            | 8,000                        |                                  | 33,693           | 3,500                        |                                  |
| 1971-72     | 60,100            | 8,000                        | 8,800                            | 35,300           | 3,500                        | 5,100                            |
| 1972-73     | 59,600            | 8,000                        | 7,500                            | 36,900           | 3,500                        | 5,100                            |
| 1973-74     | 58,800            | 8,000                        | 7,200                            | 38,400           | 3,500                        | 5,000                            |
| 1974-75     | 57,800            | 8,000                        | 7,000                            | 40,000           | 3,500                        | 5,100                            |
| 1975-76     | 56,800            | 8,000                        | 7,000                            | 41,400           | 3,500                        | 4,900                            |



### III. Colleges of Applied Arts and Technology

On the basis of enrolment projections, employment prospects for full-time teachers in Ontario Colleges of Applied Arts and Technology show a steady increase of approximately 500 teachers per year to 1975-76. This would represent a continuation of the growth in the number of teachers recorded from 2,269 in 1968-69 to 2,826 in 1969-70, and to an estimated 3,500 in 1970-71.

Faculty qualifications are largely dependent on the subject matter. A more detailed description of qualifications is outlined in the chart on the following page.

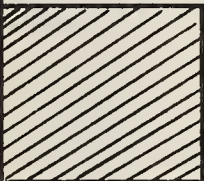
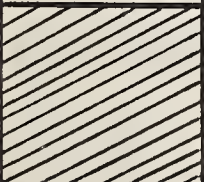
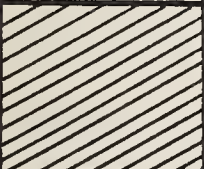
The takeover of manpower retraining programs by the colleges is a major factor in increasing full-time attendance from 28,052 in 1968-69 to 43,542 in 1969-70. Full-time attendance in 1970-71 was 53,372, which represents 13.3 per cent of the eligible enrolment in the age bracket 18-20 years. Of the full-time students, 30,382 or over one-half are post-secondary, an additional 20,433 are in manpower retraining programs, and 2,557 in apprenticeship training. A further breakdown of the post-secondary students reveals that 11,663 are taking technical or technological courses, 9,719 are enrolled in business courses, and 9,000 are in applied arts.

We are projecting steady growth in enrolment to a total of 92,900 in 1975-76. We have assumed that the proportion enrolled



FACULTY QUALIFICATIONS

subject to the requirements of the college

|   |    | Grade                                                                               |                                                                                            |   |                                          |                                           |                                         |   | Years |  |
|---|----|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---|------------------------------------------|-------------------------------------------|-----------------------------------------|---|-------|--|
|   |    | 1                                                                                   | 2                                                                                          | 3 | 4                                        | 5                                         | 6                                       | 7 |       |  |
| A | 12 | Qualified "Craftsman" plus six years of acceptable experience                       |                                                                                            |   |                                          |                                           |                                         |   |       |  |
|   |    | or                                                                                  |                                                                                            |   |                                          |                                           |                                         |   |       |  |
| B |    | Graduate of a three-year Institute of Technology or C.A.A.T. course                 |                                                                                            |   | plus four years of acceptable experience |                                           |                                         |   |       |  |
|   |    | or                                                                                  |                                                                                            |   |                                          |                                           |                                         |   |       |  |
| C |    |  | Graduation from a three-year university (pass) course                                      |   |                                          | plus three years of acceptable experience |                                         |   |       |  |
|   |    |                                                                                     | or                                                                                         |   |                                          |                                           |                                         |   |       |  |
| D | 13 |  | Completion of requirements for P.Eng. or C.A.                                              |   |                                          | plus three years of acceptable experience |                                         |   |       |  |
|   |    |                                                                                     | or                                                                                         |   |                                          |                                           |                                         |   |       |  |
| E |    |  | Graduation from an acceptable four-year honour or professional degree course or equivalent |   |                                          |                                           | plus two years of acceptable experience |   |       |  |

Note: 1. Allowances are made for

- i) additional acceptable experience beyond the minimum indicated in the chart above to a maximum of eight years,
- ii) additional acceptable academic qualifications e.g., master's and doctorate degrees,
- iii) a pass university degree in addition to qualifications in A; B; and D.

2. 'Acceptable experience' may include teaching.

3. At present, a teacher's certificate is not required for initial employment.



in 1975-76 will be 20 per cent of the 18-20 age bracket. If the pupil:teacher ratio is held at the ratio of 15:1, we will need 6,200 teachers in the Community Colleges by 1975-76 or an additional 2,700 over the five-year period.

Number of Full-Time Teachers in Ontario Colleges  
of Applied Arts and Technology, 1963-1970 with Projections for 1971-1975

| <u>Year</u>        | <u>Sub-Total</u> | <u>Technical<br/>Assistants</u> | <u>Total</u>         | <u>Ratio -<br/>Enrolment/Teachers</u> |
|--------------------|------------------|---------------------------------|----------------------|---------------------------------------|
| 1963-64            |                  |                                 | 255                  | 24.1                                  |
| 64-65              |                  |                                 | 315                  | 25.3                                  |
| 65-66              |                  |                                 | 375                  | 24.6                                  |
| 66-67              |                  |                                 | 448                  | 26.0                                  |
| 67-68              | 1,227            | 37                              | 1,264                | 15.2                                  |
| 68-69              | 2,151            | 118                             | 2,269                | 12.4                                  |
| 69-70              |                  |                                 | 2,826                | 15.4                                  |
| 70-71              |                  |                                 | 3,500 <sup>(1)</sup> | 15.9                                  |
| <u>Projections</u> |                  |                                 |                      |                                       |
| 1971-72            |                  |                                 | 4,200                | 15.0                                  |
| 72-73              |                  |                                 | 4,600                | 15.0                                  |
| 73-74              |                  |                                 | 5,100                | 15.0                                  |
| 74-75              |                  |                                 | 5,600                | 15.0                                  |
| 75-76              |                  |                                 | 6,200                | 15.0                                  |

(1) Estimated by the Department of Education.

Source: Information received from DBS Education Division.  
Projections - Department of Treasury & Economics, June 1970.



#### IV. University

Employment prospects for full-time teachers in Ontario universities (excluding research staff) show a slow growth of approximately 300 teaching positions per year from 1971-72 through 1975-76. This forecast reflects a significant reduction in teaching opportunities in comparison with the large additions over the past few years. There were 7,311 teachers in 1968-69, 8,367 in 1969-70, and an estimated 9,200 in 1970-71 - representing increments of about 1,000 and 800 respectively. According to the Dominion Bureau of Statistics, Ontario university teachers in 1970-71 were classified as follows: 160 Deans, 1,931 Full-Professors, 2,435 Associate Professors, 3,138 Assistant Professors, 174 Professors (ungraded) and 1,314 Lecturers and Instructors. With regard to teacher qualifications in 1969-70, 4,534 or 55.4 per cent of the total teaching staff held Doctorate degrees while 2,398 or 29.3 per cent had Master's degrees. About 80-90 per cent of all teachers hired by universities today possess a Doctorate degree, with possible exceptions in the language and medical faculties.

Enrolment will increase slowly to 140,800 in 1975-76. The projected number of university teachers required in 1975-76 is 11,300, an increase of approximately 1,200 teachers over the four-year projection period. In 1969-70 Ontario universities



granted 640 Ph.D.'s and the numbers in doctoral programs have been increasing. In addition, a large number of graduates come to Ontario from other provinces and from United States universities. With an average university teacher requirement of 300 additional teachers per year from 1971-72 through 1975-76, we will have a surplus. These estimates are based on a student-teacher ratio of 12.5:1.

If there were no increase in number of university teachers to 1975-76, but enrolment continued to increase, we would have a pupil:teacher ratio of 15.3:1.



Number of Full-Time Teachers in Ontario Universities<sup>(1)</sup>  
with Projections for 1971-1975

| <u>Year</u>        | <u>No. of Teachers</u> | <u>Ratio of Teachers to Enrolment</u> |
|--------------------|------------------------|---------------------------------------|
| 1960-61            | 2,288                  | 14.0                                  |
| 61-62              | n.a.                   |                                       |
| 62-63              | n.a.                   |                                       |
| 63-64              | 3,124                  | 14.1                                  |
| 64-65              | n.a.                   |                                       |
| 65-66              | 4,301                  | 13.7                                  |
| 66-67              | n.a.                   |                                       |
| 67-68              | 6,547                  | 12.1                                  |
| 68-69              | 7,311                  | 12.7                                  |
| 69-70              | 8,367                  | 12.5                                  |
| 70-71              | 9,200 <sup>(2)</sup>   | 12.8                                  |
| <u>Projections</u> |                        |                                       |
| 1971-72            | 10,000                 | 12.5                                  |
| 72-73              | 10,300                 | 12.5                                  |
| 73-74              | 10,600                 | 12.5                                  |
| 74-75              | 10,900                 | 12.5                                  |
| 75-76              | 11,300                 | 12.5                                  |

(1) Does not include research staff.

(2) Estimated by Department of Treasury & Economics.

Source: Information received from DBS Higher Education Division  
Projections - Department of Treasury & Economics.

Pupil-Teacher Ratio with Teachers Constant

|         |       |      |
|---------|-------|------|
| 1971-72 | 9,200 | 13.6 |
| 1972-73 | 9,200 | 14.0 |
| 1973-74 | 9,200 | 14.4 |
| 1974-75 | 9,200 | 14.8 |
| 1975-76 | 9,200 | 15.3 |







## CHAPTER V

### Manpower Requirements

The shifting structure of our economy over the past century has been possible with relatively little emphasis on planning of manpower requirements. We have been able to accomplish this through the device of filling the inadequacies in our own educational and training system through immigration. The Province is reaching a stage of maturity when we should be able to train most of our own work force. The shifts in industrial patterns have been quite marked (Table p. 33), and if we are to have continued economic growth, we have to provide the kinds of workers needed by the growth industries. The emphasis in training is influenced by the kind of industry which we expect to have.

#### Employment by Industry

The 19th century was highlighted by a breakthrough in the development of trade and manufacturing and the 20th century is witnessing a service revolution. In 1991, only three out of every 10 workers in Canada were employed in the service sector; 50 years later, more than half were in services. In recent years, this shift from manufacturing to services has accelerated as growth in manufacturing employment between 1961 and 1970 increased by only 32 per cent, whereas service employment increased by 55 per cent. New technical developments and the resultant productivity improvements in the goods producing sector presages a continuation of these trends. Our projections indicate that by 1991 seven out of



Percentage Distribution of Ontario Labour Force  
by Major Industry Groups, 1931-1991

| Industry                                                         | Historical<br>(per cent) |       |       |                     | Projected<br>(per cent) |       |
|------------------------------------------------------------------|--------------------------|-------|-------|---------------------|-------------------------|-------|
|                                                                  | 1931                     | 1941  | 1951  | 1961 <sup>(1)</sup> | 1971                    | 1991  |
| Agriculture                                                      | 22.5                     | 18.6  | 10.7  | 7.2                 | 4.4                     | 1.4   |
| Forestry, Fishing & Trapping                                     | 1.1                      | 1.5   | 1.3   | 0.9                 | 0.5                     | 0.3   |
| Mines, Quarries & Oil Wells                                      | 1.4                      | 2.2   | 1.6   | 1.8                 | 0.9                     | 0.4   |
| Manufacturing                                                    | 24.4                     | 30.6  | 32.8  | 27.3                | 28.5                    | 24.3  |
| Construction                                                     | 6.8                      | 5.4   | 6.7   | 6.5                 | 6.3                     | 4.8   |
| Transportation, Communication and Other Utilities <sup>(2)</sup> | 7.1                      | 5.8   | 6.7   | 8.3                 | 6.9                     | 4.4   |
| Trade                                                            | 11.1                     | 12.2  | 14.2  | 15.8                | 16.1                    | 15.3  |
| Finance, Insurance & Real Estate                                 | 2.8                      | 2.7   | 3.3   | 4.2                 | 4.3                     | 4.9   |
| Electricity, Gas & Water                                         | 1.0                      | 0.8   | 1.6   | -                   | -                       | -     |
| Community, Business & Personal Service Industries                | 18.3                     | 19.3  | 20.1  | 19.8                | 23.8                    | 34.2  |
| Public Administration and Defence <sup>(3)</sup>                 | -                        | -     | -     | 6.0                 | 6.1                     | 7.5   |
| Not stated                                                       | 3.5                      | 0.9   | 1.0   | 2.2                 | 2.2                     | 2.5   |
| Total Labour Force                                               | 100.0                    | 100.0 | 100.0 | 100.0               | 100.0                   | 100.0 |

(1) 1961 data has not been adjusted to conform with previous census definitions.

(2) Before 1961 public utilities are not included in this group.

(3) 1931 to 1951 Public Administration is included in Community, Business and Personal Services.

Source: 1931 to 1951, Occupation & Industry Trends in Canada. DBS, Ottawa 1954  
1961, Census of Canada 1961, Series 3.2-8.  
Projections prepared in the Economic Planning Branch.



every 10 workers will be in the service sector.

By 1991 the service sector of the economy will require over 3.3 million workers, that is, 2.67 times as many as in 1961. On the other hand, employment in the manufacturing sector is expected to increase by only 83 per cent. In short, service jobs will account for the overwhelming bulk of the increase in the total employment. By 1991 service jobs can easily constitute about two-thirds of all jobs in our economy.

We anticipate an increase in manufacturing jobs of about 355,000 between 1971 and 1991 as compared with almost a million increase in community, business, and personal services industries. Trade is expected to employ an additional 277,000 and the finance, insurance, and real estate industry, an additional 113,000 people. Employment in public administration and defence will about double in the 20 year period, increasing from 185,000 to 373,000 between 1971 and 1991.

A detailed breakdown of the anticipated changes in employment by industry group is shown in Table A-1. A further examination of the expected employment trends on an occupational job family basis, provides additional insights into the shifting structure of our labour market.



### Trend in Job Families

The clerical job family will employ the largest proportion of the labour force in 1991. In fact, one of every six jobs will be in this area, about 80 per cent of them in the service industry, (Table p. 36). A continued high rate of economic growth will require a substantial increase in the technician, skilled worker and tradesmen groups, particularly in manufacturing. It should be noted, however, that while the tools - non-specialized job family is expected to remain second in importance, it will continue to decline as a proportion of the total labour force. The personal service job family is expected to increase significantly from 8.7 per cent of the total labour force in 1971 to 11.9 per cent in 1991 and will be the third largest group. It is followed closely by administration and organization, largely confined to the service industry and likely to account for one of every 10 jobs at the end of the projected period. Other occupational groups which are expected to show relatively large increases in demand are health, education, machines - non-specialized and sales.

### Educational Requirements

A review of the educational achievement of the 25-34 age group in each job family by industry, in the 1961 census, together with the more recent trends in educational standards and hiring practices gives a broad indication of the educational inputs required to satisfy the demands of our growing industries.



Employment Requirements in Ontario, by Job Family  
for 1971 and 1991

| Job Family                           | Total<br>Employment 1971 |      | Total<br>Employment 1991 |      | Absolute<br>Change<br>1971-91 | Percentage<br>Change<br>1971-91 |
|--------------------------------------|--------------------------|------|--------------------------|------|-------------------------------|---------------------------------|
|                                      | No.                      | %    | No.                      | %    |                               |                                 |
| Labour Force                         | 3,017,940                | 100  | 4,977,750                | 100  | +1,959,810                    | +64.9                           |
| Tools - Specialized                  | 123,735                  | 4.1  | 179,199                  | 3.6  | +55,464                       | +44.8                           |
| Tools - Non-Specialized              | 507,014                  | 16.8 | 771,551                  | 15.5 | +264,537                      | +52.2                           |
| Machines - Specialized               | 54,323                   | 1.8  | 64,711                   | 1.3  | +10,388                       | +19.1                           |
| Machines - Non-Specialized           | 274,632                  | 9.1  | 408,176                  | 8.2  | +133,544                      | +48.6                           |
| Inspection                           | 105,628                  | 3.5  | 154,310                  | 3.1  | +48,682                       | +46.1                           |
| Vehicle Operation                    | 144,861                  | 4.8  | 199,110                  | 4.0  | +54,249                       | +37.4                           |
| Farm                                 | 123,736                  | 4.1  | 69,689                   | 1.4  | -54,047                       | -43.7                           |
| Sales - Knowledge required           | 78,466                   | 2.6  | 119,466                  | 2.4  | +41,000                       | +52.3                           |
| Sales - Knowledge not<br>required    | 165,987                  | 5.5  | 238,932                  | 4.8  | +72,945                       | +43.9                           |
| Clerical                             | 497,960                  | 16.5 | 851,195                  | 17.1 | +353,235                      | +70.9                           |
| Personal Service                     | 262,561                  | 8.7  | 592,352                  | 11.9 | +329,791                      | +125.6                          |
| Entertainment                        | 18,108                   | .6   | 39,822                   | .8   | +21,714                       | +119.9                          |
| Protection                           | 39,233                   | 1.3  | 74,666                   | 1.5  | +35,433                       | +90.3                           |
| Education and Training               | 102,610                  | 3.4  | 238,932                  | 4.8  | +136,322                      | +132.9                          |
| Health                               | 141,843                  | 4.7  | 308,621                  | 6.2  | +166,778                      | +117.6                          |
| Welfare                              | 21,126                   | .7   | 49,777                   | 1.0  | +28,651                       | +135.6                          |
| Administration and organiza-<br>tion | 298,776                  | 9.9  | 512,708                  | 10.3 | +213,932                      | +71.6                           |
| Research and Design                  | 57,341                   | 1.9  | 104,533                  | 2.1  | +47,192                       | +82.3                           |

Source: Estimated by Department of Treasury and Economics.



- Most of the 353,000 new clerical jobs in the next twenty years will require graduation from a secondary school commercial course.
- The 464,000 anticipated new mechanical, machine-oriented and tradesmen's jobs will be filled from on the job training, secondary school and community college graduates. There were an estimated 11,700 full-time, post-secondary students enrolled in technical or technological courses at the colleges in 1970-71, compared with 9,460 in 1969-70.
- Much of the increase in the personal service industries is in such areas as restaurants, hotels, recreational facilities, barber shops and hairdressing salons. People in these occupations are being trained in the Community Colleges and in some of the manpower, private trade schools and adult retraining courses.
- With respect to the managerial, administration and organization occupation family, some of the demand is for university graduates, but there is also a large requirement for people with some basic business education, along with some practical orientation. This area could draw a major part of its labour supply from the Community Colleges - where full-time, post-secondary enrolment in business courses totalled almost 10,000 in 1970-71. In the sectors where knowledge of the operation is important and where the manager is the main worker, other post-secondary institutions will provide some of the managerial personnel.



Employment in welfare is rising more rapidly than most other industries but since the base employment is relatively low, the increase in actual numbers is not expected to be significant. In terms of educational requirements, a large proportion of the labour force in this job family requires training at the university level. The development of specialized courses in the social welfare field at the Community College level will relieve the demand for university graduates in this area and will restrain the need for university trained personnel.

Most job opportunities in the area of research and design also require a university education. It should be noted once again, however, that this occupational group accounts for only a small proportion of the entire labour force. With respect to employment conditions in the field of research and design, there exists a large surplus of graduates in chemistry, chemical engineering and biochemistry, particularly at the Ph.D. level. In fact, the majority of students placed for the 1971-72 season are engaged in further study at all graduate levels, including post-doctoral studies. New employment opportunities have not been increasing at nearly the rate of university expansion. This lack of flexibility on the part of educational institutions can be found in other occupational groups as well. For example, in the education and training job family, there exists an over-supply of teachers at the elementary level.



### Institutional Requirements

More stringent control over the numbers entering certain university courses is necessary. The first step in influencing enrolment in university programs is to restrict aid to graduates and post-graduates in some of these areas where Canadian demand is never likely to be very large. Moreover, the present practice of holding people in their studies, to try to absorb a labour market surplus, is in the long run an unkindness as it will make the graduates less flexible. They will find it more difficult to accept anything but high level research jobs.

The Community Colleges, which have been moving into operation very rapidly, should be preparing the more job-oriented students for employment in business and industry. To help meet future training and educational needs, the kinds and number of Community College courses need to be increased, particularly those courses geared to occupations in the personal service industries. By shifting a larger part of the undergraduate flood to the new colleges of applied arts and technology, we would ease the anticipated shortage of undergraduate places at the university level.

As indicated in the foregoing discussion regarding the educational requirements of job families, much of the labour force expansion expected over the next 20 years will be filled from secondary school - about 50 per cent - with Community



Educational Requirements of Ontario Labour Force Increase 1971-1991

|                                                   | <u>Elementary</u> | <u>Secondary</u>   | <u>Community College<br/>and Other<br/>Post-Secondary</u> | <u>University</u> | <u>Totals</u>       |
|---------------------------------------------------|-------------------|--------------------|-----------------------------------------------------------|-------------------|---------------------|
| <u>Arts</u>                                       | 124,000           | 338,300            | 105,300                                                   | 190,500           | 758,100             |
| <u>Commerce</u>                                   | 17,600            | 475,600            | 95,900                                                    | 76,900            | 666,000             |
| <u>Health</u>                                     | 5,100             | 0                  | 112,300                                                   | 56,200            | 173,600             |
| <u>Science, Mechanical<br/>and Trade Training</u> | 75,200            | 204,100            | 39,200                                                    | 43,600            | 362,100             |
| <u>Totals</u>                                     | 221,900<br>(11%)  | 1,018,000<br>(52%) | 352,700<br>(18%)                                          | 367,200<br>(19%)  | 1,959,800<br>(100%) |

Note: For detailed breakdown, see Table A-2.

Source: Department of Treasury and Economics.



College graduates accounting for an additional 18 per cent. Notwithstanding the fact that some of the growth in demand will be for university graduates, training at this level will not constitute more than 20 per cent of overall educational requirements. In short, about 40 per cent of the increase in the Ontario labour force between 1971 and 1991 will require a post-secondary education. By comparison, in 1961 only 10 per cent of the Ontario labour force had achieved a post-secondary (university) education.

While over one-half of the jobs requiring a university education in 1991 will be in the area of arts, only about one-tenth will be in science, (Table p. 40). With respect to the educational requirements at the Community College level, about one-third will be in each of arts and health. While commerce and science together should account for the remaining number, science alone will constitute only about 10 per cent of the Community College total.







TABLE A-1

Projections of Employment in Ontario, by Industry and Sector  
for 1971 and 1991  
(most probable)

| <u>Industry</u>                        | <u>1971</u> | <u>1991</u> | <u>Absolute Change</u> | <u>% Change</u> |
|----------------------------------------|-------------|-------------|------------------------|-----------------|
| Agriculture                            | 132,190     | 72,250      | -59,940                | -45.3           |
| Forestry, Fishing & Trapping           | 14,330      | 13,210      | -1,120                 | -7.8            |
| Mines, Quarries & Oil Wells            | 28,090      | 22,070      | -6,020                 | -21.4           |
| Manufacturing Industries               | 860,500     | 1,215,170   | +354,670               | +41.2           |
| Food & beverage industries             | 108,660     | 152,240     | +43,580                | +40.1           |
| Meat Products                          | 12,660      | 17,010      | +4,350                 | +34.4           |
| Dairy Products                         | 6,440       | 4,630       | -1,810                 | -28.1           |
| Fruit & Vegetable Canners & Preservers | 15,260      | 23,890      | +8,630                 | +56.6           |
| Grain Mills                            | 7,910       | 16,270      | +8,360                 | +105.7          |
| Bakery Products                        | 17,360      | 19,050      | +1,690                 | +9.7            |
| Soft Drink Manufacturers               | 7,750       | 15,410      | +7,660                 | +98.8           |
| Distilleries                           | 3,460       | 2,910       | -550                   | -15.9           |
| Breweries                              | 3,510       | 2,650       | -860                   | -24.5           |
| Other Food & Beverage Industries       | 34,310      | 50,420      | +16,110                | +47.0           |



| <u>Industry</u>                | <u>1971</u> | <u>1991</u> | <u>Absolute Change</u> | <u>% Change</u> |
|--------------------------------|-------------|-------------|------------------------|-----------------|
| Tobacco Products Industries    | 4,370       | 5,050       | +680                   | +15.6           |
| Rubber Industries              | 18,370      | 35,590      | +17,220                | +93.7           |
| Leather Industries             | 16,420      | 21,640      | +5,220                 | +31.8           |
| Shoe Factories                 | 10,020      | 12,560      | +2,540                 | +25.3           |
| Other Leather Products         | 6,400       | 9,080       | +2,680                 | +41.9           |
| Textile Industries             | 29,690      | 25,530      | -4,160                 | -14.0           |
| Cotton Yarn & Cloth Mills      | 4,070       | 6,540       | +2,470                 | +60.7           |
| Woollen Mills                  | 6,060       | 3,880       | -2,180                 | -36.0           |
| Synthetic Textile Mills        | 7,150       | 5,110       | -2,040                 | -28.5           |
| Other Textile Industries       | 12,410      | 10,000      | -2,410                 | -19.4           |
| Clothing & Knitting            | 34,210      | 57,000      | +22,790                | +66.6           |
| Wood Industries                | 18,350      | 29,600      | +11,250                | +61.3           |
| Saw & Planing Mills            | 11,600      | 12,840      | +1,240                 | +10.7           |
| Veneer & Plywood               | 2,870       | 4,720       | +1,850                 | +64.5           |
| Other Wood Industries          | 3,880       | 12,040      | +8,160                 | +210.3          |
| Furniture & Fixture Industries | 19,390      | 32,860      | +13,470                | +70.2           |
| Paper & Allied Industries      | 45,530      | 71,880      | +26,350                | +57.9           |
| Pulp & Paper Mills             | 20,350      | 15,890      | -4,460                 | -21.9           |
| Other Paper Products           | 23,180      | 55,990      | +32,180                | +138.8          |



| <u>Industry</u>                                                                 | <u>1971</u> | <u>1991</u> | <u>Absolute Change</u> | <u>% Change</u> |
|---------------------------------------------------------------------------------|-------------|-------------|------------------------|-----------------|
| Printing, Publishing & Allied Industries                                        | 49,630      | 69,350      | +19,720                | +39.7           |
| Primary Metal Industries                                                        | 69,410      | 74,690      | +5,280                 | +7.6            |
| Metal Fabricating Ind. (except machinery & transportation equipment industries) | 77,580      | 91,230      | +13,650                | +17.6           |
| Machinery Industries (except electrical machinery)                              | 53,800      | 47,240      | -6,560                 | -12.2           |
| Transportation Equipment Industries                                             | 104,520     | 141,180     | +36,660                | +35.1           |
| Aircraft & Parts                                                                | 14,260      | 13,020      | -1,240                 | -8.7            |
| Motor Vehicles Manufacturers                                                    | 39,250      | 44,800      | +5,550                 | +14.1           |
| Motor Vehicle Parts & Access. Mfrs.                                             | 39,340      | 68,500      | +29,160                | +74.1           |
| Railroad Rolling Stock                                                          | 3,900       | 6,440       | +2,540                 | +65.1           |
| Shipbuilding & Repair                                                           | 2,050       | 960         | -1,090                 | -53.2           |
| Other Transportation Equipment Industries                                       | 5,520       | 7,460       | +1,940                 | +35.1           |
| Electric Products Industries                                                    | 83,350      | 191,360     | +108,010               | +129.6          |
| Manufacture of Major Appliances                                                 | 13,000      | 27,090      | +14,090                | +108.4          |
| Communication Equipment Appliances                                              | 24,650      | 34,680      | +10,030                | +40.7           |
| Manufacturers of Electrical Industrial Equipment                                | 17,980      | 28,720      | +10,740                | +59.7           |



| <u>Industry</u>                                              | <u>1971</u> | <u>1991</u> | <u>Absolute Change</u> | <u>% Change</u> |
|--------------------------------------------------------------|-------------|-------------|------------------------|-----------------|
| Other Electrical Equipment<br>Manufacturers                  | 27,720      | 100,870     | +73,150                | +262.9          |
| Non-Metallic Mineral Products<br>Industries                  | 27,240      | 47,860      | +20,620                | +75.7           |
| Cement Manufacturers                                         | 1,610       | 1,970       | +360                   | +22.4           |
| Concrete Product Manufacturers                               | 5,920       | 10,740      | +4,820                 | +81.4           |
| Clay Products Manufacturers                                  | 3,330       | 2,990       | -340                   | -10.2           |
| Other Non-Metallic Mineral<br>Products                       | 16,380      | 32,160      | +15,780                | +96.3           |
| Petroleum & Coal Products Industries                         | 7,030       | 4,500       | -2,530                 | -36.0           |
| Chemical & Chemical Products "                               | 42,880      | 47,460      | +4,580                 | +10.7           |
| Miscellaneous Manufacturing "                                | 52,070      | 74,910      | +22,840                | +43.9           |
| Construction Industry                                        | 189,140     | 238,240     | +49,100                | +26.0           |
| Transportation, Communication and other<br>Utilities         | 208,620     | 220,540     | +11,920                | +5.7            |
| Transportation                                               | 120,200     | 132,650     | +12,450                | +10.4           |
| Air Transportation & Services<br>Incidental to Air Transport | 6,310       | 6,370       | +60                    | +1.0            |
| Water Transport & Services<br>Incidental to Water Transport  | 6,580       | 5,870       | -710                   | -10.8           |
| Railway Transport                                            | 35,960      | 24,220      | -11,740                | -32.6           |
| Truck Transport                                              | 34,320      | 54,000      | +19,680                | +57.3           |
| Bus Transport, Interurban and<br>Rural                       | 2,010       | 3,380       | +1,370                 | +68.2           |



| <u>Industry</u>                                   | <u>1971</u> | <u>1991</u> | <u>Absolute Change</u> | <u>% Change</u> |
|---------------------------------------------------|-------------|-------------|------------------------|-----------------|
| Urban Transit System                              | 8,580       | 9,630       | +1,050                 | +12.2           |
| Other Transportation                              |             |             |                        |                 |
| Storage                                           | 3,220       | 2,330       | -890                   | -27.6           |
| Communication                                     | 48,980      | 38,040      | -10,940                | -22.3           |
| Electric Power, Gas & Water Utilities             | 36,220      | 47,520      | +11,300                | +31.2           |
| Total Trade                                       | 487,510     | 764,240     | +276,730               | +56.8           |
| Wholesale Trade                                   | 131,170     | 230,730     | +99,560                | +75.9           |
| Retail Trade                                      | 356,340     | 533,510     | +177,170               | +49.7           |
| Finance, Insurance & Real Estate                  | 130,610     | 243,900     | +113,290               | +86.7           |
| Community, Business & Personal Service Industries | 716,870     | 1,707,830   | +990,960               | +138.2          |
| Public Administration and Defence                 | 185,080     | 372,670     | +187,590               | +101.4          |
| Total Service Sector                              | 1,728,690   | 3,309,180   | +1,580,490             | +94.3           |
| Total Non-Manufacturing Industries                | 2,092,440   | 3,654,950   | +1,562,510             | +74.7           |
| Industry, Unspecified & Undefined                 | 65,000      | 107,630     | +42,360                | +65.2           |
| Grand Total                                       | 3,017,940   | 4,977,750   | +1,959,810             | +64.9           |



## Type of Education Required for Additional Jobs 1971-1991

Agriculture -60,000

## Ontario

| Job Family           | Science |        |     |       | Arts |     |    |   | Commerce |   |    |     |
|----------------------|---------|--------|-----|-------|------|-----|----|---|----------|---|----|-----|
|                      | E       | S      | CC  | U     | E    | S   | CC | U | E        | S | CC | U   |
| 1. Tools-Spec.       |         |        |     |       |      |     |    |   |          |   |    |     |
| 2. Tools-Non-Spec.   |         |        |     |       |      |     |    |   |          |   |    |     |
| 3. Machines Spec.    |         |        |     |       |      |     |    |   |          |   |    |     |
| 4. Mach.-Non-Spec.   |         |        |     |       |      |     |    |   |          |   |    |     |
| 5. Inspection        |         |        |     |       |      |     |    |   |          |   |    |     |
| 6. Vehicle Operat.   |         |        |     |       |      |     |    |   |          |   |    |     |
| 7. Farm              | 22,700  | 32,800 |     | 1,100 |      |     |    |   |          |   |    |     |
| 8. Sales Know.Req.   |         |        |     |       |      |     |    |   |          |   |    |     |
| 9. Sales Know. Not.  |         |        |     |       |      |     |    |   |          |   |    |     |
| 10. Clerical         |         |        |     |       |      |     |    |   | 200      |   |    | 100 |
| 11. Personal Service | 300     | 450    |     | 100   | 300  | 450 |    |   |          |   |    |     |
| 12. Entertainment    |         |        |     |       |      |     |    |   |          |   |    |     |
| 13. Protection       |         |        |     |       |      |     |    |   |          |   |    |     |
| 14. Educat. & Train. |         |        |     |       |      |     |    |   |          |   |    |     |
| 15. Health           |         |        |     |       |      |     |    |   |          |   |    |     |
| 16. Welfare          |         |        |     |       |      |     |    |   |          |   |    |     |
| 17. Admin. & Organ.  |         | 100    | 100 | 100   |      |     |    |   |          |   |    |     |
| 18. Research & Des.  |         |        |     |       |      |     |    |   |          |   |    |     |
| Total                | 23,000  | 33,350 | 100 | 1,300 | 300  | 450 | 0  | 0 | 200      | 0 | 0  | 100 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Forestry, Fishing & Trapping -1100

Ontario

| Job Family           | Science |     |    | Arts |   |    | Commerce |     |     |
|----------------------|---------|-----|----|------|---|----|----------|-----|-----|
|                      | E       | S   | CC | E    | S | CC | E        | S   | CC  |
| 1. Tools-Spec.       | 200     | 300 |    |      |   |    |          |     |     |
| 2. Tools-Non-Spec.   |         |     |    |      |   |    |          |     |     |
| 3. Machines Spec.    |         |     |    |      |   |    |          |     |     |
| 4. Mach.-Non-Spec.   |         |     |    |      |   |    |          |     |     |
| 5. Inspection        |         |     |    |      |   |    |          |     |     |
| 6. Vehicle Operat.   |         |     |    |      |   |    |          |     |     |
| 7. Farm              |         |     |    |      |   |    |          |     |     |
| 8. Sales Know.Req.   |         |     |    |      |   |    |          |     |     |
| 9. Sales Know. Not.  |         |     |    |      |   |    |          |     |     |
| 10. Clerical         |         |     |    |      |   |    |          |     |     |
| 11. Personal Service |         |     |    |      |   |    |          |     |     |
| 12. Entertainment    |         |     |    |      |   |    |          |     |     |
| 13. Protection       |         |     |    |      |   |    |          |     |     |
| 14. Educat. & Train. |         |     |    |      |   |    |          |     |     |
| 15. Health           |         |     |    |      |   |    |          |     |     |
| 16. Welfare          |         |     |    |      |   |    |          |     |     |
| 17. Admin. & Organ.  |         |     |    |      |   |    |          |     | 100 |
| 18. Research & Des.  |         |     |    |      |   |    |          |     |     |
| Total                | 200     | 300 | 0  | 0    | 0 | 0  | 0        | 100 | 0   |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Mines -6,000

Ontario

| Job Family           | Science |       |     | Arts |   |   | Commerce |   |   |
|----------------------|---------|-------|-----|------|---|---|----------|---|---|
|                      | E       | S     | CC  | U    | E | S | CC       | U |   |
| 1. Tools-Spec.       |         |       |     |      |   |   |          |   |   |
| 2. Tools-Non-Spec.   | 300     | 600   | 100 |      |   |   |          |   |   |
| 3. Machines Spec.    | 1,200   | 1,500 | 200 | 200  |   |   |          |   |   |
| 4. Mach.-Non-Spec.   | 100     | 200   |     |      |   |   |          |   |   |
| 5. Inspection        | 100     | 300   |     |      |   |   |          |   |   |
| 6. Vehicle Operat.   | 200     | 100   |     |      |   |   |          |   |   |
| 7. Farm              |         |       |     |      |   |   |          |   |   |
| 8. Sales Know.Req.   |         |       |     |      |   |   |          |   |   |
| 9. Sales Know. Not.  |         |       |     |      |   |   |          |   |   |
| 10. Clerical         |         |       |     |      |   |   |          |   |   |
| 11. Personal Service |         |       |     |      |   |   |          |   |   |
| 12. Entertainment    |         |       |     |      |   |   |          |   |   |
| 13. Protection       |         |       |     |      |   |   |          |   |   |
| 14. Educat. & Train. |         |       |     |      |   |   |          |   |   |
| 15. Health           |         |       |     |      |   |   |          |   |   |
| 16. Welfare          |         |       |     |      |   |   |          |   |   |
| 17. Admin. & Organ.  |         |       | 100 | 100  |   |   |          |   |   |
| 18. Research & Des.  |         |       |     | 200  |   |   |          |   |   |
| Total                | 1,900   | 2,700 | 400 | 500  | 0 | 0 | 0        | 0 | 0 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Food & Beverage +43,600

Ontario

| Job Family           | Science |        |       | Arts  |       |       | Commerce |       |       |
|----------------------|---------|--------|-------|-------|-------|-------|----------|-------|-------|
|                      | E       | S      | CC    | E     | S     | CC    | E        | S     | CC    |
| 1. Tools-Spec.       |         |        |       |       |       |       |          |       |       |
| 2. Tools-Non-Spec.   | 2,600   | 3,400  | 600   |       |       |       |          |       |       |
| 3. Machines Spec.    | 1,000   | 1,200  | 200   |       |       |       |          |       |       |
| 4. Mach.-Non-Spec.   | 4,300   | 5,400  | 1,100 |       |       |       |          |       |       |
| 5. Inspection        | 300     | 1,500  | 400   |       |       |       |          |       |       |
| 6. Vehicle Operat.   | 2,700   | 3,500  | 700   |       |       |       |          |       |       |
| 7. Farm              |         |        |       |       |       |       |          |       |       |
| 8. Sales Know. Req.  |         |        |       |       |       |       |          |       |       |
| 9. Sales Know. Not.  |         | 900    | 200   |       |       |       | 200      | 900   | 100   |
| 10. Clerical         |         |        |       |       |       |       |          | 3,300 | 1,100 |
| 11. Personal Service |         |        |       |       |       |       |          |       |       |
| 12. Entertainment    |         |        |       |       |       |       |          |       |       |
| 13. Protection       |         |        |       |       |       |       |          |       |       |
| 14. Educat. & Train. |         |        |       |       |       |       |          |       |       |
| 15. Health           |         |        |       |       |       |       |          |       |       |
| 16. Welfare          |         |        |       |       |       |       |          |       |       |
| 17. Admin. & Organ.  |         | 1,100  | 300   |       | 1,000 | 200   |          |       | 400   |
| 18. Research & Des.  |         |        | 100   |       |       | 100   |          |       |       |
| Total                | 10,900  | 17,000 | 3,600 | 1,000 | 0     | 1,000 | 200      | 500   | 200   |
|                      |         |        |       |       |       |       |          |       | 1,200 |
|                      |         |        |       |       |       |       |          |       | 0     |

Figures do not add to totals because some categories were too small to include.



Ontario

| Job Family           | Science |     |    | Arts |   |   | Commerce |   |     |
|----------------------|---------|-----|----|------|---|---|----------|---|-----|
|                      | E       | S   | CC | U    | E | S | CC       | U |     |
| 1. Tools-Spec.       |         |     |    |      |   |   |          |   | 100 |
| 2. Tools-Non-Spec.   |         |     |    |      |   |   |          |   |     |
| 3. Machines Spec.    |         |     |    |      |   |   |          |   |     |
| 4. Mach.-Non-Spec.   | 100     | 300 |    |      |   |   |          |   |     |
| 5. Inspection        |         |     |    |      |   |   |          |   |     |
| 6. Vehicle Operat.   |         |     |    |      |   |   |          |   |     |
| 7. Farm              |         |     |    |      |   |   |          |   |     |
| 8. Sales Know.Req.   |         |     |    |      |   |   |          |   |     |
| 9. Sales Know. Not.  |         |     |    |      |   |   |          |   |     |
| 10. Clerical         |         |     |    |      |   |   |          |   |     |
| 11. Personal Service |         |     |    |      |   |   |          |   |     |
| 12. Entertainment    |         |     |    |      |   |   |          |   |     |
| 13. Protection       |         |     |    |      |   |   |          |   |     |
| 14. Educat. & Train. |         |     |    |      |   |   |          |   |     |
| 15. Health           |         |     |    |      |   |   |          |   |     |
| 16. Welfare          |         |     |    |      |   |   |          |   |     |
| 17. Admin. & Organ.  |         |     |    |      |   |   |          |   |     |
| 18. Research & Des.  |         |     |    |      |   |   |          |   |     |
| Total                | 100     | 300 | 0  | 0    | 0 | 0 | 0        | 0 | 0   |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Rubber +17,200

Ontario

| Job Family           | Science |       |     | Arts |   |    | Commerce |       |     |
|----------------------|---------|-------|-----|------|---|----|----------|-------|-----|
|                      | E       | S     | CC  | E    | S | CC | E        | S     | CC  |
| 1. Tools-Spec.       |         |       |     |      |   |    |          |       |     |
| 2. Tools-Non-Spec.   | 800     | 1,700 |     |      |   |    |          |       |     |
| 3. Machines Spec.    |         |       |     |      |   |    |          |       |     |
| 4. Mach.-Non-Spec.   | 2,000   | 5,700 | 100 |      |   |    |          |       |     |
| 5. Inspection        |         | 900   | 200 |      |   |    |          |       |     |
| 6. Vehicle Operat.   |         |       |     |      |   |    |          |       |     |
| 7. Farm              |         |       |     |      |   |    |          |       |     |
| 8. Sales Know.Req.   |         |       |     |      |   |    |          |       |     |
| 9. Sales Know. Not.  |         |       |     |      |   |    | 2,200    | 100   | 300 |
| 10. Clerical         |         |       |     |      |   |    |          |       |     |
| 11. Personal Service |         |       |     |      |   |    |          |       |     |
| 12. Entertainment    |         |       |     |      |   |    |          |       |     |
| 13. Protection       |         |       |     |      |   |    |          |       |     |
| 14. Educat. & Train. |         |       |     |      |   |    |          |       |     |
| 15. Health           |         |       |     |      |   |    |          |       |     |
| 16. Welfare          |         |       |     |      |   |    |          |       |     |
| 17. Admin. & Organ.  |         | 200   | 100 |      |   |    | 200      |       | 100 |
| 18. Research & Des.  |         |       | 100 |      |   |    |          |       |     |
| Total                | 2,800   | 8,500 | 400 | 0    | 0 | 0  | 0        | 2,800 | 100 |
|                      |         |       | 700 |      |   |    |          | 400   |     |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Leather +5,200

Ontario

| Job Family           | Science |       |     | Arts |   |   | Commerce |     |  |
|----------------------|---------|-------|-----|------|---|---|----------|-----|--|
|                      | E       | S     | CC  | U    | E | S | CC       | U   |  |
| 1. Tools-Spec.       |         |       |     |      |   |   |          |     |  |
| 2. Tools-Non-Spec.   | 200     | 300   |     |      |   |   |          |     |  |
| 3. Machines Spec.    |         |       |     |      |   |   |          |     |  |
| 4. Mach.-Non-Spec.   | 1,300   | 2,000 | 100 |      |   |   |          |     |  |
| 5. Inspection        |         |       |     |      |   |   |          |     |  |
| 6. Vehicle Operat.   |         |       |     |      |   |   |          |     |  |
| 7. Farm              |         |       |     |      |   |   |          |     |  |
| 8. Sales Know.Req.   |         |       |     |      |   |   |          |     |  |
| 9. Sales Know. Not.  |         |       |     |      |   |   |          |     |  |
| 10. Clerical         |         |       |     |      |   |   |          |     |  |
| 11. Personal Service |         |       |     |      |   |   |          |     |  |
| 12. Entertainment    |         |       |     |      |   |   |          |     |  |
| 13. Protection       |         |       |     |      |   |   |          |     |  |
| 14. Educat. & Train. |         |       |     |      |   |   |          |     |  |
| 15. Health           |         |       |     |      |   |   |          |     |  |
| 16. Welfare          |         |       |     |      |   |   |          |     |  |
| 17. Admin. & Organ.  |         |       |     |      |   |   |          |     |  |
| 18. Research & Des.  |         |       |     |      |   |   | 100      | 100 |  |
| Total                | 1,500   | 2,300 | 100 | 0    | 0 | 0 | 100      | 100 |  |

1,500 2,300 100 0 0 0 0 100 100

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Textiles -4,200

Ontario

| Job Family           | Science |       |     |     | Arts |     |     |     | Commerce |   |    |     |
|----------------------|---------|-------|-----|-----|------|-----|-----|-----|----------|---|----|-----|
|                      | E       | S     | CC  | U   | E    | S   | CC  | U   | E        | S | CC | U   |
| 1. Tools-Spec.       | 100     | 200   |     |     |      |     |     |     |          |   |    |     |
| 2. Tools-Non-Spec.   |         |       |     |     | 400  | 200 |     |     |          |   |    |     |
| 3. Machines Spec.    | 200     | 200   | 100 |     |      |     |     |     |          |   |    |     |
| 4. Mach.-Non-Spec.   | 300     | 400   | 50  |     | 300  | 400 | 50  |     |          |   |    |     |
| 5. Inspection        |         | 200   |     | 100 |      |     |     |     |          |   |    |     |
| 6. Vehicle Operat.   |         |       |     |     |      |     |     |     |          |   |    |     |
| 7. Farm              |         |       |     |     |      |     |     |     |          |   |    |     |
| 8. Sales Know.Req.   |         |       |     |     |      |     |     |     |          |   |    |     |
| 9. Sales Know. Not.  |         |       |     |     |      |     |     |     |          |   |    |     |
| 10. Clerical         |         |       |     |     |      |     |     |     | 300      |   |    | 100 |
| 11. Personal Service |         |       |     |     |      |     |     |     |          |   |    |     |
| 12. Entertainment    |         |       |     |     |      |     |     |     |          |   |    |     |
| 13. Protection       |         |       |     |     |      |     |     |     |          |   |    |     |
| 14. Educat. & Train. |         |       |     |     |      |     |     |     |          |   |    |     |
| 15. Health           |         |       |     |     |      |     |     |     |          |   |    |     |
| 16. Welfare          |         |       |     |     |      |     |     |     |          |   |    |     |
| 17. Admin. & Organ.  |         |       |     |     |      |     | 100 | 100 |          |   |    |     |
| 18. Research & Des.  |         |       |     | 100 |      |     |     |     |          |   |    |     |
| Total                | 600     | 1,000 | 150 | 200 | 700  | 700 | 150 | 0   | 300      | 0 | 0  | 100 |

Figures do not add to totals because some categories were too small to include.



# Type of Education Required for Additional Jobs 1971-1991

Clothing & Knitting +22,800

Ontario

| Job Family           | Science |       |     | Arts |        |       | Commerce |     |     |       |     |     |
|----------------------|---------|-------|-----|------|--------|-------|----------|-----|-----|-------|-----|-----|
|                      | E       | S     | CC  | U    | E      | S     | CC       | U   |     |       |     |     |
| 1. Tools-Spec.       | 2,300   | 1,000 | 100 |      |        |       |          |     |     |       |     |     |
| 2. Tools-Non-Spec.   | 600     | 500   |     |      |        |       |          |     |     |       |     |     |
| 3. Machines Spec.    |         |       |     |      |        |       |          |     |     |       |     |     |
| 4. Mach.-Non-Spec.   | 8,000   | 5,000 |     |      |        |       |          |     |     |       |     |     |
| 5. Inspection        | 200     | 500   |     |      |        |       |          |     |     |       |     |     |
| 6. Vehicle Operat.   |         |       |     |      |        |       |          |     |     |       |     |     |
| 7. Farm              |         |       |     |      |        |       |          |     |     |       |     |     |
| 8. Sales Know.Req.   |         |       |     |      | 600    |       | 100      |     |     |       |     |     |
| 9. Sales Know. Not.  |         |       |     |      | 200    | 1,500 | 100      |     |     |       |     |     |
| 10. Clerical         |         |       |     |      |        |       |          |     |     |       |     |     |
| 11. Personal Service |         |       |     |      |        |       |          |     |     |       |     |     |
| 12. Entertainment    |         |       |     |      |        |       |          |     |     |       |     |     |
| 13. Protection       |         |       |     |      |        |       |          |     |     |       |     |     |
| 14. Educat. & Train. |         |       |     |      |        |       |          |     |     |       |     |     |
| 15. Health           |         |       |     |      |        |       |          |     |     |       |     |     |
| 16. Welfare          |         |       |     |      |        |       |          |     |     |       |     |     |
| 17. Admin. & Organ.  |         |       |     |      | 900    |       | 200      | 300 |     |       |     |     |
| 18. Research & Des.  |         |       |     |      |        |       |          |     |     |       |     |     |
| Total                | 0       | 0     | 0   | 0    | 11,100 | 7,000 | 100      | 0   | 200 | 3,000 | 400 | 300 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Wood +11,300

Ontario

| Job Family           | Science |     |     | Arts  |       |     | Commerce |     |     |
|----------------------|---------|-----|-----|-------|-------|-----|----------|-----|-----|
|                      | E       | S   | CC  | E     | S     | CC  | E        | S   | CC  |
| 1. Tools-Spec.       |         |     |     | 700   | 600   |     |          |     |     |
| 2. Tools-Non-Spec.   |         |     |     | 1,900 | 1,900 |     |          |     |     |
| 3. Machines Spec.    |         |     |     |       |       |     |          |     |     |
| 4. Mach.-Non-Spec.   |         |     |     | 1,100 | 1,100 |     |          |     |     |
| 5. Inspection        | 100     | 500 | 100 |       |       |     |          |     |     |
| 6. Vehicle Operat.   |         |     |     | 400   | 400   |     |          |     |     |
| 7. Farm              |         |     |     |       |       |     |          |     |     |
| 8. Sales Know.Req.   |         |     |     |       |       |     |          |     |     |
| 9. Sales Know. Not.  |         |     |     |       |       |     |          |     |     |
| 10. Clerical         |         |     |     | 600   |       | 100 |          |     |     |
| 11. Personal Service |         |     |     |       |       |     |          |     |     |
| 12. Entertainment    |         |     |     |       |       |     |          |     |     |
| 13. Protection       |         |     |     |       |       |     |          |     |     |
| 14. Educat. & Train. |         |     |     |       |       |     |          |     |     |
| 15. Health           |         |     |     |       |       |     |          |     |     |
| 16. Welfare          |         |     |     |       |       |     |          |     |     |
| 17. Admin. & Organ.  |         | 300 | 100 |       |       |     |          |     |     |
| 18. Research & Des.  |         |     |     |       |       |     |          | 300 | 100 |
| Total                | 100     | 800 | 200 | 4,100 | 4,600 | 100 | 0        | 300 | 0   |

Figures do not add to totals because some categories were too small to include.



# Type of Education Required for Additional Jobs 1971-1991

Furniture +13,500

Ontario

| Job Family           | Science |       |     |   | Arts |     |     |   | Commerce |     |     |     |
|----------------------|---------|-------|-----|---|------|-----|-----|---|----------|-----|-----|-----|
|                      | E       | S     | CC  | U | E    | S   | CC  | U | E        | S   | CC  | U   |
| 1. Tools-Spec.       |         |       |     |   |      |     |     |   |          |     |     |     |
| 2. Tools-Non-Spec.   | 2,600   | 2,700 | 200 |   |      |     |     |   |          |     |     |     |
| 3. Machines Spec.    |         |       |     |   |      |     |     |   |          |     |     |     |
| 4. Mach.-Non-Spec.   | 1,600   | 1,700 | 200 |   |      |     |     |   |          |     |     |     |
| 5. Inspection        | 100     | 400   | 100 |   |      |     |     |   |          |     |     |     |
| 6. Vehicle Operat.   |         |       |     |   |      |     |     |   |          |     |     |     |
| 7. Farm              |         |       |     |   |      |     |     |   |          |     |     |     |
| 8. Sales Know.Req.   |         |       |     |   |      |     |     |   |          |     |     |     |
| 9. Sales Know. Not.  |         |       |     |   |      |     |     |   |          |     |     |     |
| 10. Clerical         |         |       |     |   |      |     |     |   | 900      | 100 | 100 |     |
| 11. Personal Service |         |       |     |   |      |     |     |   |          |     |     |     |
| 12. Entertainment    |         |       |     |   |      |     |     |   |          |     |     |     |
| 13. Protection       |         |       |     |   |      |     |     |   |          |     |     |     |
| 14. Educat. & Train. |         |       |     |   |      |     |     |   |          |     |     |     |
| 15. Health           |         |       |     |   |      |     |     |   |          |     |     |     |
| 16. Welfare          |         |       |     |   |      |     |     |   |          |     |     |     |
| 17. Admin. & Organ.  |         |       |     |   |      |     |     |   | 300      |     |     | 100 |
| 18. Research & Des.  |         |       | 100 |   | 400  | 100 | 200 |   |          |     |     |     |
| Total                | 4,300   | 4,800 | 600 | 0 | 400  | 100 | 200 | 0 | 1,200    | 100 | 200 | 200 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Paper & Allied +26,400

Ontario

| Job Family           | Science |        |       | Arts  |   |       | Commerce |       |     |
|----------------------|---------|--------|-------|-------|---|-------|----------|-------|-----|
|                      | E       | S      | CC    | U     | E | S     | CC       | U     |     |
| 1. Tools-Spec.       | 600     | 700    |       |       |   |       |          |       |     |
| 2. Tools-Non-Spec.   | 2,700   | 3,500  | 700   | 300   |   |       |          |       |     |
| 3. Machines Spec.    |         |        |       |       |   |       |          |       |     |
| 4. Mach.-Non-Spec.   | 2,900   | 4,600  | 800   | 400   |   |       |          |       |     |
| 5. Inspection        | 100     | 1,200  | 200   | 200   |   |       |          |       |     |
| 6. Vehicle Operat.   |         |        |       |       |   |       |          |       |     |
| 7. Farm              |         |        |       |       |   |       |          |       |     |
| 8. Sales Know.Req.   |         |        |       |       |   |       |          |       |     |
| 9. Sales Know. Not.  |         |        |       |       |   |       |          |       |     |
| 10. Clerical         |         |        |       |       |   | 2,300 | 200      | 300   |     |
| 11. Personal Service |         |        |       |       |   |       |          |       |     |
| 12. Entertainment    |         |        |       |       |   |       |          |       |     |
| 13. Protection       |         |        |       |       |   |       |          |       |     |
| 14. Educat. & Train. |         |        |       |       |   |       |          |       |     |
| 15. Health           |         |        |       |       |   |       |          |       |     |
| 16. Welfare          |         |        |       |       |   |       |          |       |     |
| 17. Admin. & Organ.  |         | 400    |       | 100   |   | 400   | 100      | 200   |     |
| 18. Research & Des.  |         |        | 100   | 400   |   |       |          |       |     |
| Total                | 6,300   | 10,400 | 1,800 | 1,400 | 0 | 0     | 0        | 2,700 | 500 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Printing, Publishing & Allied +19,700

Ontario

| Job Family           | Science |       |     | Arts  |       |       | Commerce |     |     |
|----------------------|---------|-------|-----|-------|-------|-------|----------|-----|-----|
|                      | E       | S     | CC  | E     | S     | CC    | E        | S   | CC  |
| 1. Tools-Spec.       |         |       |     | 2,000 |       | 1,000 |          |     |     |
| 2. Tools-Non-Spec.   | 100     | 900   |     |       |       |       |          |     |     |
| 3. Machines Spec.    | 200     | 1,400 | 100 |       |       |       |          |     |     |
| 4. Mach.-Non-Spec.   | 100     | 800   |     |       |       |       |          |     |     |
| 5. Inspection        |         |       |     | 200   |       |       |          |     |     |
| 6. Vehicle Operat.   |         |       |     |       |       |       |          |     |     |
| 7. Farm              |         |       |     |       |       |       |          |     |     |
| 8. Sales Know.Req.   |         |       |     |       |       |       |          |     |     |
| 9. Sales Know. Not.  |         |       |     | 600   |       | 600   |          |     | 600 |
| 10. Clerical         |         |       |     | 500   | 3,500 | 100   |          |     |     |
| 11. Personal Service |         |       |     |       |       |       |          |     |     |
| 12. Entertainment    |         |       |     |       |       |       |          |     |     |
| 13. Protection       |         |       |     |       |       |       |          |     |     |
| 14. Educat. & Train. |         |       |     |       |       |       |          |     |     |
| 15. Health           |         |       |     |       |       |       |          |     |     |
| 16. Welfare          |         |       |     |       |       |       |          |     |     |
| 17. Admin. & Organ.  |         |       |     | 1,000 |       |       |          | 500 | 300 |
| 18. Research & Des.  |         |       |     |       |       |       |          |     |     |
| Total                | 400     | 3,100 | 100 | 500   | 7,300 | 1,700 | 2,700    | 500 | 300 |

0

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Primary Metals +5,300

Ontario

| Job Family           | Science |       |     | Arts |   |     | Commerce |     |     |
|----------------------|---------|-------|-----|------|---|-----|----------|-----|-----|
|                      | E       | S     | CC  | E    | S | CC  | E        | S   | CC  |
| 1. Tools-Spec.       |         |       |     |      |   |     |          |     |     |
| 2. Tools-Non-Spec.   | 800     | 1,100 |     |      |   |     |          |     |     |
| 3. Machines Spec.    |         |       |     |      |   |     |          |     |     |
| 4. Mach.-Non-Spec.   | 600     | 900   |     |      |   |     |          |     |     |
| 5. Inspection        |         | 400   | 100 |      |   |     |          |     |     |
| 6. Vehicle Operat.   |         |       |     |      |   |     |          |     |     |
| 7. Farm              |         |       |     |      |   |     |          |     |     |
| 8. Sales Know.Req.   |         |       |     |      |   |     |          |     |     |
| 9. Sales Know. Not.  |         |       |     |      |   |     |          |     |     |
| 10. Clerical         |         |       |     |      |   |     |          | 400 | 100 |
| 11. Personal Service |         |       |     |      |   |     |          |     |     |
| 12. Entertainment    |         |       |     |      |   |     |          |     |     |
| 13. Protection       |         |       |     |      |   |     |          |     |     |
| 14. Educat. & Train. |         |       |     |      |   |     |          |     |     |
| 15. Health           |         |       |     |      |   |     |          |     |     |
| 16. Welfare          |         |       |     |      |   |     |          |     |     |
| 17. Admin. & Organ.  |         |       |     |      |   |     |          |     |     |
| 18. Research & Des.  |         |       | 100 |      |   | 100 |          |     |     |
| Total                | 1,400   | 2,400 | 200 | 100  | 0 | 0   | 0        | 400 | 0   |

100

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Metal Fabricating +13,700

Ontario

| Job Family           | Science |       |       | Arts |   |   | Commerce |       |     |
|----------------------|---------|-------|-------|------|---|---|----------|-------|-----|
|                      | E       | S     | CC    | U    | E | S | CC       | U     |     |
| 1. Tools-Spec.       |         |       |       |      |   |   |          |       |     |
| 2. Tools-Non-Spec.   | 1,900   | 2,400 | 500   | 100  |   |   |          |       |     |
| 3. Machines Spec.    |         |       |       |      |   |   |          |       |     |
| 4. Mach.-Non-Spec.   | 1,000   | 1,800 | 300   |      |   |   |          |       |     |
| 5. Inspection        | 100     | 600   | 100   | 100  |   |   |          |       |     |
| 6. Vehicle Operat.   |         |       |       |      |   |   |          |       |     |
| 7. Farm              |         |       |       |      |   |   |          |       |     |
| 8. Sales Know.Req.   |         |       |       |      |   |   |          |       |     |
| 9. Sales Know. Not.  |         |       |       |      |   |   |          |       |     |
| 10. Clerical         |         |       |       |      |   |   | 1,400    | 100   | 100 |
| 11. Personal Service |         |       |       |      |   |   |          |       |     |
| 12. Entertainment    |         |       |       |      |   |   |          |       |     |
| 13. Protection       |         |       |       |      |   |   |          |       |     |
| 14. Educat. & Train. |         |       |       |      |   |   |          |       |     |
| 15. Health           |         |       |       |      |   |   |          |       |     |
| 16. Welfare          |         |       |       |      |   |   |          |       |     |
| 17. Admin. & Organ.  |         | 300   | 200   | 200  |   |   | 200      | 100   | 100 |
| 18. Research & Des.  |         | 100   | 200   | 200  |   |   |          |       |     |
| Total                | 3,000   | 5,200 | 1,300 | 600  | 0 | 0 | 0        | 1,600 | 200 |

Figures do not add to totals because some categories were too small to include.



# Type of Education Required for Additional Jobs 1971-1991

Machinery -6,600

## Ontario

| Job Family           | Science |       |     |     | Arts |   |    |   | Commerce |   |     |     |
|----------------------|---------|-------|-----|-----|------|---|----|---|----------|---|-----|-----|
|                      | E       | S     | CC  | U   | E    | S | CC | U | E        | S | CC  | U   |
| 1. Tools-Spec.       |         |       |     |     |      |   |    |   |          |   |     |     |
| 2. Tools-Non-Spec.   | 700     | 1,200 | 200 |     |      |   |    |   |          |   |     |     |
| 3. Machines Spec.    |         |       |     |     |      |   |    |   |          |   |     |     |
| 4. Mach.-Non-Spec.   | 400     | 800   | 100 |     |      |   |    |   |          |   |     |     |
| 5. Inspection        |         | 400   | 100 |     |      |   |    |   |          |   |     |     |
| 6. Vehicle Operat.   |         |       |     |     |      |   |    |   |          |   |     |     |
| 7. Farm              |         |       |     |     |      |   |    |   |          |   |     |     |
| 8. Sales Know.Req.   |         |       |     |     |      |   |    |   |          |   |     |     |
| 9. Sales Know. Not.  |         |       |     |     |      |   |    |   |          |   |     |     |
| 10. Clerical         |         |       |     |     |      |   |    |   | 1,100    |   |     | 100 |
| 11. Personal Service |         |       |     |     |      |   |    |   |          |   |     |     |
| 12. Entertainment    |         |       |     |     |      |   |    |   |          |   |     |     |
| 13. Protection       |         |       |     |     |      |   |    |   |          |   |     |     |
| 14. Educat. & Train. |         |       |     |     |      |   |    |   |          |   |     |     |
| 15. Health           |         |       |     |     |      |   |    |   |          |   |     |     |
| 16. Welfare          |         |       |     |     |      |   |    |   |          |   |     |     |
| 17. Admin. & Organ.  |         |       | 100 | 300 |      |   |    |   |          |   | 100 |     |
| 18. Research & Des.  |         |       | 100 | 200 |      |   |    |   |          |   |     |     |
| Total                | 1,100   | 2,400 | 600 | 500 | 0    | 0 | 0  | 0 | 1,100    | 0 | 100 | 100 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Transportation Equipment +36,700

Ontario

| Job Family           | Science |        |     |       | Arts |   |    |   | Commerce |       |     |     |
|----------------------|---------|--------|-----|-------|------|---|----|---|----------|-------|-----|-----|
|                      | E       | S      | CC  | U     | E    | S | CC | U | E        | S     | CC  | U   |
| 1. Tools-Spec.       |         |        |     |       |      |   |    |   |          |       |     |     |
| 2. Tools-Non-Spec.   | 3,900   | 8,700  | 100 | 200   |      |   |    |   |          |       |     |     |
| 3. Machines Spec.    |         |        |     |       |      |   |    |   |          |       |     |     |
| 4. Mach.-Non-Spec.   | 2,600   | 5,800  | 100 | 100   |      |   |    |   |          |       |     |     |
| 5. Inspection        | 300     | 2,800  | 100 | 400   |      |   |    |   |          |       |     |     |
| 6. Vehicle Operat.   |         |        |     |       |      |   |    |   |          |       |     |     |
| 7. Farm              |         |        |     |       |      |   |    |   |          |       |     |     |
| 8. Sales Know.Req.   |         |        |     |       |      |   |    |   |          |       |     |     |
| 9. Sales Know. Not.  |         |        |     |       |      |   |    |   |          |       |     |     |
| 10. Clerical         |         |        |     |       |      |   |    |   | 5,100    | 200   |     | 400 |
| 11. Personal Service |         |        |     |       |      |   |    |   |          |       |     |     |
| 12. Entertainment    |         |        |     |       |      |   |    |   |          |       |     |     |
| 13. Protection       |         |        |     |       |      |   |    |   |          |       |     |     |
| 14. Educat. & Train. |         |        |     |       |      |   |    |   |          |       |     |     |
| 15. Health           |         |        |     |       |      |   |    |   |          |       |     |     |
| 16. Welfare          |         |        |     |       |      |   |    |   |          |       |     |     |
| 17. Admin. & Organ.  |         | 200    | 100 | 400   |      |   |    |   | 200      | 100   |     | 400 |
| 18. Research & Des.  |         |        | 300 | 1,000 |      |   |    |   |          |       |     |     |
| Total                | 6,800   | 17,500 | 700 | 2,100 | 0    | 0 | 0  | 0 | 0        | 5,300 | 300 | 800 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Electrical Products +108,000

Ontario

| Job Family           | Science |        |       | Arts  |   |        | Commerce |   |        |
|----------------------|---------|--------|-------|-------|---|--------|----------|---|--------|
|                      | E       | S      | CC    | U     | E | S      | CC       | U |        |
| 1. Tools-Spec.       |         |        |       |       |   |        |          |   |        |
| 2. Tools-Non-Spec.   | 4,000   | 17,100 | 400   | 500   |   |        |          |   |        |
| 3. Machines Spec.    |         |        |       |       |   |        |          |   |        |
| 4. Mach.-Non-Spec.   | 6,000   | 22,800 | 700   | 800   |   |        |          |   |        |
| 5. Inspection        | 1,400   | 8,600  | 2,100 | 1,400 |   |        |          |   |        |
| 6. Vehicle Operat.   |         |        |       |       |   |        |          |   |        |
| 7. Farm              |         |        |       |       |   |        |          |   |        |
| 8. Sales Know.Req.   |         |        |       |       |   |        |          |   |        |
| 9. Sales Know. Not.  |         |        |       |       |   |        |          |   |        |
| 10. Clerical         |         |        |       |       |   | 17,100 | 100      |   | 200    |
| 11. Personal Service |         |        |       |       |   |        |          |   |        |
| 12. Entertainment    |         |        |       |       |   |        |          |   |        |
| 13. Protection       |         |        |       |       |   |        |          |   |        |
| 14. Educat. & Train. |         |        |       |       |   |        |          |   |        |
| 15. Health           |         |        |       |       |   |        |          |   |        |
| 16. Welfare          |         |        |       |       |   |        |          |   |        |
| 17. Admin. & Organ.  | 1,500   | 800    | 1,000 |       |   | 1,200  | 700      |   | 1,000  |
| 18. Research & Des.  |         |        |       |       |   |        |          |   |        |
| Total                | 11,400  | 50,000 | 5,900 | 9,500 | 0 | 0      | 0        | 0 | 18,300 |
|                      |         |        |       |       |   |        | 800      |   | 1,200  |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Non-metallic mineral products +20,600

Ontario

| Job Family           | Science |       |     | Arts |     |       | Commerce |     |     |
|----------------------|---------|-------|-----|------|-----|-------|----------|-----|-----|
|                      | E       | S     | CC  | U    | E   | S     | CC       | U   |     |
| 1. Tools-Spec.       |         |       |     |      |     |       |          |     |     |
| 2. Tools-Non-Spec.   | 1,500   | 3,300 | 200 | 100  |     |       |          |     |     |
| 3. Machines Spec.    |         |       |     |      |     |       |          |     |     |
| 4. Mach.-Non-Spec.   | 1,600   | 3,500 | 200 | 100  |     |       |          |     |     |
| 5. Inspection        |         |       |     |      | 200 | 1,000 | 100      | 100 |     |
| 6. Vehicle Operat.   |         |       |     |      |     |       | 1,700    | 100 | 100 |
| 7. Farm              |         |       |     |      |     |       |          |     |     |
| 8. Sales Know.Req.   |         |       |     |      |     |       |          |     |     |
| 9. Sales Know. Not.  |         |       |     |      |     |       |          |     |     |
| 10. Clerical         | 1,000   | 900   |     |      |     |       |          |     |     |
| 11. Personal Service |         |       |     |      |     |       |          |     |     |
| 12. Entertainment    |         |       |     |      |     |       |          |     |     |
| 13. Protection       |         |       |     |      |     |       |          |     |     |
| 14. Educat. & Train. |         |       |     |      |     |       |          |     |     |
| 15. Health           |         |       |     |      |     |       |          |     |     |
| 16. Welfare          |         |       |     |      |     |       |          |     |     |
| 17. Admin. & Organ.  |         |       | 500 |      |     | 500   |          |     |     |
| 18. Research & Des.  |         |       | 100 | 200  |     |       |          |     |     |
| Total                | 4,100   | 7,700 | 500 | 900  | 200 | 1,500 | 200      | 200 | 100 |

4,100

7,700

500

900

200

1,500

200

200

0

1,700

600

100

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Petroleum & Coal Products -2,500      Ontario

| Job Family           | Science |     |     |     | Arts |   |    |   | Commerce |     |    |   |
|----------------------|---------|-----|-----|-----|------|---|----|---|----------|-----|----|---|
|                      | E       | S   | CC  | U   | E    | S | CC | U | E        | S   | CC | U |
| 1. Tools-Spec.       |         |     |     |     |      |   |    |   |          |     |    |   |
| 2. Tools-Non-Spec.   | 200     | 300 |     |     |      |   |    |   |          |     |    |   |
| 3. Machines Spec.    |         |     |     |     |      |   |    |   |          |     |    |   |
| 4. Mach.-Non-Spec.   | 200     | 200 |     | 100 |      |   |    |   |          |     |    |   |
| 5. Inspection        |         | 200 | 100 |     |      |   |    |   |          |     |    |   |
| 6. Vehicle Operat.   |         |     |     |     |      |   |    |   |          |     |    |   |
| 7. Farm              |         |     |     |     |      |   |    |   |          |     |    |   |
| 8. Sales Know.Req.   |         |     |     |     |      |   |    |   |          |     |    |   |
| 9. Sales Know. Not.  |         |     |     |     |      |   |    |   |          |     |    |   |
| 10. Clerical         |         |     |     |     |      |   |    |   | 300      | 100 |    |   |
| 11. Personal Service |         |     |     |     |      |   |    |   |          |     |    |   |
| 12. Entertainment    |         |     |     |     |      |   |    |   |          |     |    |   |
| 13. Protection       |         |     |     |     |      |   |    |   |          |     |    |   |
| 14. Educat. & Train. |         |     |     |     |      |   |    |   |          |     |    |   |
| 15. Health           |         |     |     |     |      |   |    |   |          |     |    |   |
| 16. Welfare          |         |     |     |     |      |   |    |   |          |     |    |   |
| 17. Admin. & Organ.  |         | 100 |     | 100 |      |   |    |   |          |     |    |   |
| 18. Research & Des.  |         |     |     | 300 |      |   |    |   |          |     |    |   |
| Total                | 400     | 800 | 100 | 500 | 0    | 0 | 0  | 0 | 300      | 100 |    | 0 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Chemical & Chemical Products +4,600

Ontario

| Job Family           | Science |       |     |     | Arts |   |    |   | Commerce |     |     |     |
|----------------------|---------|-------|-----|-----|------|---|----|---|----------|-----|-----|-----|
|                      | E       | S     | CC  | U   | E    | S | CC | U | E        | S   | CC  | U   |
| 1. Tools-Spec.       |         |       |     |     |      |   |    |   |          |     |     |     |
| 2. Tools-Non-Spec.   | 100     | 400   |     | 100 |      |   |    |   |          |     |     |     |
| 3. Machines Spec.    |         |       |     |     |      |   |    |   |          |     |     |     |
| 4. Mach.-Non-Spec.   | 200     | 700   | 100 |     |      |   |    |   |          |     |     |     |
| 5. Inspection        |         | 200   | 100 | 100 |      |   |    |   |          |     |     |     |
| 6. Vehicle Operat.   |         |       |     |     |      |   |    |   |          |     |     |     |
| 7. Farm              |         |       |     |     |      |   |    |   |          |     |     |     |
| 8. Sales Know.Req.   |         |       |     |     |      |   |    |   |          |     |     |     |
| 9. Sales Know. Not.  |         | 400   | 100 |     |      |   |    |   |          |     |     |     |
| 10. Clerical         |         |       |     |     |      |   |    |   | 700      |     |     | 100 |
| 11. Personal Service |         |       |     |     |      |   |    |   |          |     |     |     |
| 12. Entertainment    |         |       |     |     |      |   |    |   |          |     |     |     |
| 13. Protection       |         |       |     |     |      |   |    |   |          |     |     |     |
| 14. Educat. & Train. |         |       |     |     |      |   |    |   |          |     |     |     |
| 15. Health           |         |       |     |     |      |   |    |   |          |     |     |     |
| 16. Welfare          |         |       |     |     |      |   |    |   |          |     |     |     |
| 17. Admin. & Organ.  |         |       | 100 | 100 |      |   |    |   |          |     | 100 | 100 |
| 18. Research & Des.  |         |       | 100 | 200 |      |   |    |   |          |     |     |     |
| Total                | 300     | 1,700 | 500 | 500 | 0    | 0 | 0  | 0 | 0        | 700 | 100 | 200 |

Figures do not add to totals because some categories were too small to include.



# Type of Education Required for Additional Jobs 1971-1991

Construction +49,100

Ontario

| Job Family           | Science |        |       |       | Arts |   |    |   | Commerce |     |    |     |
|----------------------|---------|--------|-------|-------|------|---|----|---|----------|-----|----|-----|
|                      | E       | S      | CC    | U     | E    | S | CC | U | E        | S   | CC | U   |
| 1. Tools-Spec.       | 2,000   | 3,200  | 200   |       |      |   |    |   |          |     |    |     |
| 2. Tools-Non-Spec.   | 10,000  | 17,600 | 200   |       |      |   |    |   |          |     |    |     |
| 3. Machines Spec.    | 800     | 1,400  | 100   |       |      |   |    |   |          |     |    |     |
| 4. Mach.-Non-Spec.   | 800     | 900    | 100   |       |      |   |    |   |          |     |    |     |
| 5. Inspection        | 800     | 800    | 100   | 100   |      |   |    |   |          |     |    |     |
| 6. Vehicle Operat.   | 700     | 1,200  |       |       |      |   |    |   |          |     |    |     |
| 7. Farm              |         |        |       |       |      |   |    |   |          |     |    |     |
| 8. Sales Know.Req.   |         |        |       |       |      |   |    |   |          |     |    |     |
| 9. Sales Know. Not.  |         |        |       |       |      |   |    |   |          |     |    |     |
| 10. Clerical         |         |        |       |       |      |   |    |   | 1,700    | 100 |    | 300 |
| 11. Personal Servic. |         |        |       |       |      |   |    |   |          |     |    |     |
| 12. Entertainment    |         |        |       |       |      |   |    |   |          |     |    |     |
| 13. Protection       |         |        |       |       |      |   |    |   |          |     |    |     |
| 14. Educat. & Train. |         |        |       |       |      |   |    |   |          |     |    |     |
| 15. Health           |         |        |       |       |      |   |    |   |          |     |    |     |
| 16. Welfare          |         |        |       |       |      |   |    |   |          |     |    |     |
| 17. Admin. & Organ.  |         | 2,500  | 1,500 | 1,500 |      |   |    |   |          |     |    |     |
| 18. Research & Des.  |         |        | 100   | 400   |      |   |    |   |          |     |    |     |
| Total                | 15,100  | 27,600 | 2,300 | 2,000 | 0    | 0 | 0  | 0 | 1,700    | 100 |    | 300 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Transportation +12,500

Ontario

| Job Family           | Science |       |     | Arts |     |       | Commerce |     |  |
|----------------------|---------|-------|-----|------|-----|-------|----------|-----|--|
|                      | E       | S     | CC  | U    | E   | S     | CC       | U   |  |
| 1. Tools-Spec.       |         |       |     |      |     |       |          |     |  |
| 2. Tools-Non-Spec.   | 900     | 1,700 |     |      |     |       |          |     |  |
| 3. Machines Spec.    |         |       |     |      |     |       |          |     |  |
| 4. Mach.-Non-Spec.   |         |       |     |      |     |       |          |     |  |
| 5. Inspection        |         |       |     |      |     |       |          |     |  |
| 6. Vehicle Operat.   | 2,500   | 2,400 | 100 |      |     |       |          |     |  |
| 7. Farm              |         |       |     |      |     |       |          |     |  |
| 8. Sales Know.Req.   |         |       |     |      |     |       |          |     |  |
| 9. Sales Know. Not.  |         |       |     |      |     |       |          |     |  |
| 10. Clerical         |         |       |     |      |     | 1,600 |          | 200 |  |
| 11. Personal Service |         |       |     |      |     |       |          |     |  |
| 12. Entertainment    |         |       |     |      |     |       |          |     |  |
| 13. Protection       |         |       |     |      |     |       |          |     |  |
| 14. Educat. & Train. |         |       |     |      |     |       |          |     |  |
| 15. Health           |         |       |     |      |     |       |          |     |  |
| 16. Welfare          |         |       |     |      |     |       |          |     |  |
| 17. Admin. & Organ.  |         |       |     |      | 200 |       | 100      | 300 |  |
| 18. Research & Des.  |         |       | 100 |      |     |       |          |     |  |
| Total                | 3,400   | 4,100 | 0   | 200  | 0   | 200   | 1,600    | 500 |  |

Figures do not add to totals because some categories were too small to include.



Ontario

| Job Family           | Science |     |     | Arts |   |     | Commerce |   |     |
|----------------------|---------|-----|-----|------|---|-----|----------|---|-----|
|                      | E       | S   | CC  | E    | S | CC  | E        | S | CC  |
| 1. Tools-Spec.       |         |     |     |      |   |     |          |   |     |
| 2. Tools-Non-Spec.   | 100     | 100 | 100 |      |   |     |          |   |     |
| 3. Machines Spec.    |         |     |     |      |   |     |          |   |     |
| 4. Mach.-Non-Spec.   | 100     |     |     |      |   |     |          |   |     |
| 5. Inspection        |         | 100 |     |      |   |     |          |   |     |
| 6. Vehicle Operat.   |         | 100 |     |      |   |     |          |   |     |
| 7. Farm              |         |     |     |      |   |     |          |   |     |
| 8. Sales Know. Req.  |         |     |     |      |   |     |          |   |     |
| 9. Sales Know. Not.  |         |     |     |      |   |     |          |   |     |
| 10. Clerical         | 100     | 100 |     |      |   |     |          |   |     |
| 11. Personal Service |         |     |     |      |   |     |          |   |     |
| 12. Entertainment    |         |     |     |      |   |     |          |   |     |
| 13. Protection       |         |     |     |      |   |     |          |   |     |
| 14. Educat. & Train. |         |     |     |      |   |     |          |   |     |
| 15. Health           |         |     |     |      |   |     |          |   |     |
| 16. Welfare          |         |     |     |      |   |     |          |   |     |
| 17. Admin. & Organ.  |         |     |     |      |   |     |          |   | 100 |
| 18. Research & Des.  |         |     |     |      |   |     |          |   |     |
| Total                | 300     | 400 | 100 | 0    | 0 | 100 | 0        | 0 | 0   |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Communications      -11,000

Ontario

| Job Family           | Science |     |     |       | Arts |   |    |     | Commerce |     |     |     |
|----------------------|---------|-----|-----|-------|------|---|----|-----|----------|-----|-----|-----|
|                      | E       | S   | CC  | U     | E    | S | CC | U   | E        | S   | CC  | U   |
| 1. Tools-Spec.       |         | 200 | 600 | 600   |      |   |    |     |          |     |     |     |
| 2. Tools-Non-Spec.   |         |     |     |       |      |   |    |     |          |     |     |     |
| 3. Machines Spec.    |         |     |     |       |      |   |    |     |          |     |     |     |
| 4. Mach.-Non-Spec.   |         |     |     |       |      |   |    |     |          |     |     |     |
| 5. Inspection        |         | 200 | 200 | 100   |      |   |    |     |          |     |     |     |
| 6. Vehicle Operat.   |         |     |     |       |      |   |    |     |          |     |     |     |
| 7. Farm              |         |     |     |       |      |   |    |     |          |     |     |     |
| 8. Sales Know.Req.   |         |     |     |       |      |   |    |     |          |     |     |     |
| 9. Sales Know. Not.  |         |     |     |       |      |   |    |     |          |     |     |     |
| 10. Clerical         |         |     |     |       |      |   |    |     | 5,500    | 700 |     | 700 |
| 11. Personal Service |         |     |     |       |      |   |    |     |          |     |     |     |
| 12. Entertainment    |         |     |     |       |      |   |    |     |          |     |     |     |
| 13. Protection       |         |     |     |       |      |   |    |     |          |     |     |     |
| 14. Educat. & Train. |         |     |     |       |      |   |    |     |          |     |     |     |
| 15. Health           |         |     |     |       |      |   |    |     |          |     |     |     |
| 16. Welfare          |         |     |     |       |      |   |    |     |          |     |     |     |
| 17. Admin. & Organ.  |         |     | 100 | 200   |      |   |    | 100 | 400      |     | 100 |     |
| 18. Research & Des.  |         |     |     | 200   |      |   |    |     |          |     |     |     |
| Total                | 0       | 400 | 900 | 1,100 | 0    | 0 | 0  | 0   | 5,900    | 800 |     | 700 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Electric Power, Gas & Water Utilities +11,300

Ontario

| Job Family           | Science |       |     |       | Arts |   |    |   | Commerce |       |     |     |
|----------------------|---------|-------|-----|-------|------|---|----|---|----------|-------|-----|-----|
|                      | E       | S     | CC  | U     | E    | S | CC | U | E        | S     | CC  | U   |
| 1. Tools-Spec.       |         | 1,100 | 200 | 200   |      |   |    |   |          |       |     |     |
| 2. Tools-Non-Spec.   | 1,000   | 1,600 | 200 | 100   |      |   |    |   |          |       |     |     |
| 3. Machines Spec.    |         |       |     |       |      |   |    |   |          |       |     |     |
| 4. Mach.-Non-Spec.   |         |       |     |       |      |   |    |   |          |       |     |     |
| 5. Inspection        |         | 700   | 100 | 100   |      |   |    |   |          |       |     |     |
| 6. Vehicle Operat.   |         |       |     |       |      |   |    |   |          |       |     |     |
| 7. Farm              |         |       |     |       |      |   |    |   |          |       |     |     |
| 8. Sales Know.Req.   |         |       |     |       |      |   |    |   |          |       |     |     |
| 9. Sales Know. Not.  |         |       |     |       |      |   |    |   |          |       |     |     |
| 10. Clerical         |         |       |     |       |      |   |    |   | 2,600    | 100   |     |     |
| 11. Personal Service |         |       |     |       |      |   |    |   |          |       |     |     |
| 12. Entertainment    |         |       |     |       |      |   |    |   |          |       |     |     |
| 13. Protection       |         |       |     |       |      |   |    |   |          |       |     |     |
| 14. Educat. & Train. |         |       |     |       |      |   |    |   |          |       |     |     |
| 15. Health           |         |       |     |       |      |   |    |   |          |       |     |     |
| 16. Welfare          |         |       |     |       |      |   |    |   |          |       |     |     |
| 17. Admin. & Organ.  |         | 200   |     | 200   |      |   |    |   | 100      |       | 200 |     |
| 18. Research & Des.  |         |       | 200 | 600   |      |   |    |   |          |       |     |     |
| Total                | 1,000   | 3,600 | 700 | 1,200 | 0    | 0 | 0  | 0 | 0        | 2,600 | 200 | 200 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Wholesale Trade +99,600

Ontario

| Job Family           | Science |        |       |       | Arts |        |       |       | Commerce |        |       |       |
|----------------------|---------|--------|-------|-------|------|--------|-------|-------|----------|--------|-------|-------|
|                      | E       | S      | CC    | U     | E    | S      | CC    | U     | E        | S      | CC    | U     |
| 1. Tools-Spec.       |         |        |       |       |      |        |       |       |          |        |       |       |
| 2. Tools-Non-Spec.   | 4,000   | 9,500  | 300   | 300   |      |        |       |       |          |        |       |       |
| 3. Machines Spec.    |         |        |       |       |      |        |       |       |          |        |       |       |
| 4. Mach.-Non-Spec.   | 1,600   | 3,200  | 100   | 100   |      |        |       |       |          |        |       |       |
| 5. Inspection        |         |        |       |       |      |        |       |       |          |        |       |       |
| 6. Vehicle Operat.   | 3,500   | 5,300  |       |       |      |        |       |       |          |        |       |       |
| 7. Farm              |         |        |       |       |      |        |       |       |          |        |       |       |
| 8. Sales Know.Req.   |         | 5,000  | 800   | 400   |      |        |       |       |          |        |       |       |
| 9. Sales Know. Not.  |         |        |       |       |      |        |       |       |          |        |       |       |
| 10. Clerical         |         |        |       |       |      |        |       |       | 12,600   | 2,500  | 2,500 |       |
| 11. Personal Service |         |        |       |       |      |        |       |       | 20,500   |        | 2,200 |       |
| 12. Entertainment    |         |        |       |       |      |        |       |       |          |        |       |       |
| 13. Protection       |         |        |       |       |      |        |       |       |          |        |       |       |
| 14. Educat. & Train. |         |        |       |       |      |        |       |       |          |        |       |       |
| 15. Health           |         |        |       |       |      |        |       |       |          |        |       |       |
| 16. Welfare          |         |        |       |       |      |        |       |       |          |        |       |       |
| 17. Admin. & Organ.  |         |        |       |       |      |        |       |       | 10,600   | 1,500  | 2,500 |       |
| 18. Research & Des.  |         |        | 300   | 1,000 |      |        |       |       |          |        |       |       |
| Total                | 9,100   | 23,000 | 1,500 | 1,800 | 0    | 10,600 | 1,500 | 2,500 | 0        | 33,100 | 4,000 | 7,200 |

Figures do not add to totals because some categories were too small to include.



# Type of Education Required for Additional Jobs 1971-1991

Retail Trade +177,200

## Ontario

| Job Family           | Science |        |     | Arts |   |        | Commerce  |              |              |
|----------------------|---------|--------|-----|------|---|--------|-----------|--------------|--------------|
|                      | E       | S      | CC  | U    | E | S      | CC        | U            |              |
| 1. Tools-Spec.       |         |        |     |      |   |        |           |              |              |
| 2. Tools-Non-Spec.   | 7,000   | 22,700 | 600 | 600  |   |        |           |              |              |
| 3. Machines Spec.    |         |        |     |      |   |        |           |              |              |
| 4. Mach.-Non-Spec.   | 1,500   | 4,300  | 100 | 100  |   |        |           |              |              |
| 5. Inspection        |         |        |     |      |   |        |           |              |              |
| 6. Vehicle Operat.   | 5,000   | 5,700  |     |      |   |        |           |              |              |
| 7. Farm              |         |        |     |      |   |        |           |              | - 74 -       |
| 8. Sales Know.Req.   |         |        |     |      |   | 3,400  | 1,000     | 500          |              |
| 9. Sales Know. Not.  |         |        |     |      |   | 42,500 | 5,000     | 3,000        |              |
| 10. Clerical         |         |        |     |      |   | 1,000  | 22,000    | 1,500        | 1,500        |
| 11. Personal Service |         |        |     |      |   |        |           |              |              |
| 12. Entertainment    |         |        |     |      |   |        |           |              |              |
| 13. Protection       |         |        |     |      |   |        |           |              |              |
| 14. Educat. & Train. |         |        |     |      |   |        |           |              |              |
| 15. Health           |         |        |     |      |   |        |           |              |              |
| 16. Welfare          |         |        |     |      |   |        |           |              |              |
| 17. Admin. & Organ.  |         |        |     |      |   | 20,800 | 2,800     | 11,000       | 2,800        |
| 18. Research & Des.  |         |        |     |      |   |        | 100       | 100          |              |
| Total                | 13,500  | 32,700 | 700 | 700  | 0 | 20,800 | 100 2,900 | 1,000 67,900 | 18,500 7,800 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Finance, Insurance & Real Estate +113,300

Ontario

| Job Family           | Science |   |    | Arts  |       |       | Commerce |        |        |
|----------------------|---------|---|----|-------|-------|-------|----------|--------|--------|
|                      | E       | S | CC | E     | S     | CC    | E        | S      | CC     |
| 1. Tools-Spec.       |         |   |    |       |       |       |          |        |        |
| 2. Tools-Non-Spec.   |         |   |    | 2,000 | 1,100 | 1,000 |          |        |        |
| 3. Machines Spec.    |         |   |    |       |       |       |          |        |        |
| 4. Mach.-Non-Spec.   |         |   |    |       |       |       |          |        |        |
| 5. Inspection        |         |   |    |       |       |       |          |        |        |
| 6. Vehicle Operat.   |         |   |    |       |       |       |          |        |        |
| 7. Farm              |         |   |    |       |       |       |          |        |        |
| 8. Sales Know.Req.   |         |   |    |       |       |       | 10,000   | 8,000  | 4,000  |
| 9. Sales Know. Not.  |         |   |    |       |       |       |          |        |        |
| 10. Clerical         |         |   |    |       |       |       | 45,000   | 12,800 | 6,400  |
| 11. Personal Service |         |   |    | 1,000 | 500   | 500   |          |        |        |
| 12. Entertainment    |         |   |    |       |       |       |          |        |        |
| 13. Protection       |         |   |    |       |       |       |          |        |        |
| 14. Educat. & Train. |         |   |    |       |       |       |          |        |        |
| 15. Health           |         |   |    |       |       |       |          |        |        |
| 16. Welfare          |         |   |    |       |       |       |          |        |        |
| 17. Admin. & Organ.  |         |   |    | 3,000 | 3,000 | 3,000 | 3,000    | 3,000  | 3,000  |
| 18. Research & Des.  |         |   |    | 100   | 200   | 300   | 100      | 100    | 200    |
| Total                | 0       | 0 | 0  | 0     | 6,100 | 4,800 | 4,800    | 0      | 58,000 |

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Community, Business & Personal Services +991,000

Ontario

| Job Family                           | Science |       |        |        | Arts   |         |        |         | Commerce |         |        |        |
|--------------------------------------|---------|-------|--------|--------|--------|---------|--------|---------|----------|---------|--------|--------|
|                                      | E       | S     | CC     | U      | E      | S       | CC     | U       | E        | S       | CC     | U      |
| 1. Tools-Spec.                       |         |       |        |        | 4,760  | 4,760   |        |         | 4,760    | 16,750  | 2,000  | 665    |
| 2. Tools-Non-Spec.                   |         |       |        |        |        |         |        |         | 9,520    | 47,025  | 4,760  | 1,140  |
| 3. Machines Spec.                    |         | 1,905 | 950    | 950    |        |         |        |         |          |         |        |        |
| 4. Mach.-Non-Spec.                   | 2,380   | 7,520 | 475    | 190    |        |         |        |         |          |         |        |        |
| 5. Inspection                        |         |       |        |        | 570    | 2,475   | 1,430  | 1,430   |          |         |        |        |
| 6. Vehicle Operat.                   |         |       |        |        | 4,760  | 4,855   |        |         |          |         |        |        |
| 7. Farm                              |         |       |        |        |        |         |        |         |          |         |        |        |
| 8. Sales Know.Req.                   |         |       |        |        |        | 2,855   | 570    | 570     |          |         |        |        |
| 9. Sales Know. Not.                  |         |       |        |        |        |         |        |         | 760      | 3,905   | 1,620  | 1,620  |
| 10. Clerical                         |         |       |        |        |        |         |        |         |          | 110,430 | 5,710  | 5,710  |
| 11. Personal Servic.                 |         |       |        |        | 71,400 | 142,795 | 47,600 | 27,600  |          |         |        |        |
| 12. Entertainment                    |         |       |        |        | 950    | 10,590  | 3,500  | 4,760   |          |         |        |        |
| 13. Protection                       |         |       |        |        | 2,570  | 5,235   | 190    | 380     |          |         |        |        |
| 14. Educat. & Train.                 |         |       |        |        |        | 8,570   | 23,800 | 95,195  |          |         |        |        |
| 15. Health (refer to following page) |         |       |        |        |        |         |        |         |          |         |        |        |
| 16. Welfare                          |         |       |        |        |        |         |        |         |          | 4,285   | 8,570  | 12,850 |
| 17. Admin. & Organ.                  |         |       |        |        |        |         |        |         |          | 9,520   | 9,520  | 6,665  |
| 18. Research & Des.                  |         |       |        |        |        |         |        |         |          |         |        |        |
| Total                                | 2,380   | 9,425 | 12,850 | 13,885 | 88,820 | 203,080 | 82,230 | 147,355 | 15,040   | 191,915 | 32,180 | 28,650 |

2,380 9,425 12,850 13,885 88,820 203,080 82,230 147,355 15,040 191,915 32,180 28,650

Figures do not add to totals because some categories were too small to include.



Type of Education Required for Additional Jobs 1971-1991

Community, Business & Personal Services +991,000      Ontario

| <u>Job Family</u> | <u>Health</u> |          |           |          |
|-------------------|---------------|----------|-----------|----------|
|                   | <u>E</u>      | <u>S</u> | <u>CC</u> | <u>U</u> |
| Health            | 4,760         |          | 104,715   | 52,360   |

Total                      4,760      0      104,715      52,360

Figures do not add to totals because some categories were too small to include.



Public Administration and Defence +187,600

Type of Education Required for Additional Jobs 1971-1991

Ontario

| Job Family           | Science |   |       |       | Arts   |        |       |        | Commerce |        |       |        |
|----------------------|---------|---|-------|-------|--------|--------|-------|--------|----------|--------|-------|--------|
|                      | E       | S | CC    | U     | E      | S      | CC    | U      | E        | S      | CC    | U      |
| 1. Tools-Spec.       |         |   |       |       |        |        |       |        |          |        |       |        |
| 2. Tools-Non-Spec.   |         |   |       |       | 7,000  | 18,000 | 1,400 | 600    |          |        |       |        |
| 3. Machines Spec.    |         |   |       |       |        |        |       |        |          |        |       |        |
| 4. Mach.-Non-Spec.   |         |   |       |       | 1,000  | 2,300  | 400   | 200    |          |        |       |        |
| 5. Inspection        |         |   |       |       |        | 6,000  | 2,000 | 2,000  |          |        |       |        |
| 6. Vehicle Operat.   |         |   |       |       | 2,900  | 2,900  |       |        |          |        |       |        |
| 7. Farm              |         |   |       |       |        |        |       |        |          |        |       |        |
| 8. Sales Know.Req.   |         |   |       |       |        |        |       |        |          |        |       |        |
| 9. Sales Know. Not.  |         |   |       |       |        |        |       |        |          |        |       |        |
| 10. Clerical         |         |   |       |       |        |        |       |        |          | 52,300 | 6,000 | 6,000  |
| 11. Personal Service |         |   |       |       | 1,800  | 4,000  | 600   | 700    |          |        |       |        |
| 12. Entertainment    |         |   |       |       |        |        |       |        |          |        |       |        |
| 13. Protection       |         |   | 3,000 | 3,000 |        | 18,800 |       |        |          |        |       |        |
| 14. Educat. & Train. |         |   |       |       |        |        |       |        |          |        |       |        |
| 15. Health           |         |   |       |       |        |        |       |        |          |        |       |        |
| 16. Welfare          |         |   |       |       |        |        |       |        |          |        |       |        |
| 17. Admin. & Organ.  |         |   | 1,000 | 2,000 |        | 2,000  | 2,000 | 10,000 |          | 1,000  | 3,000 |        |
| 18. Research & Des.  |         |   | 1,000 | 3,000 |        | 1,000  | 1,000 | 3,000  |          |        |       | 1,300  |
| Total                | 0       | 0 | 5,000 | 8,000 | 12,700 | 55,000 | 7,400 | 16,500 | 0        | 52,300 | 7,000 | 10,300 |

Figures do not add to totals because some categories were too small to include.

Date Due

MAY 24 1977

LA/418/.06/.E38/1971

Ontario. Dept. of Treasury

Education in Ontario

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